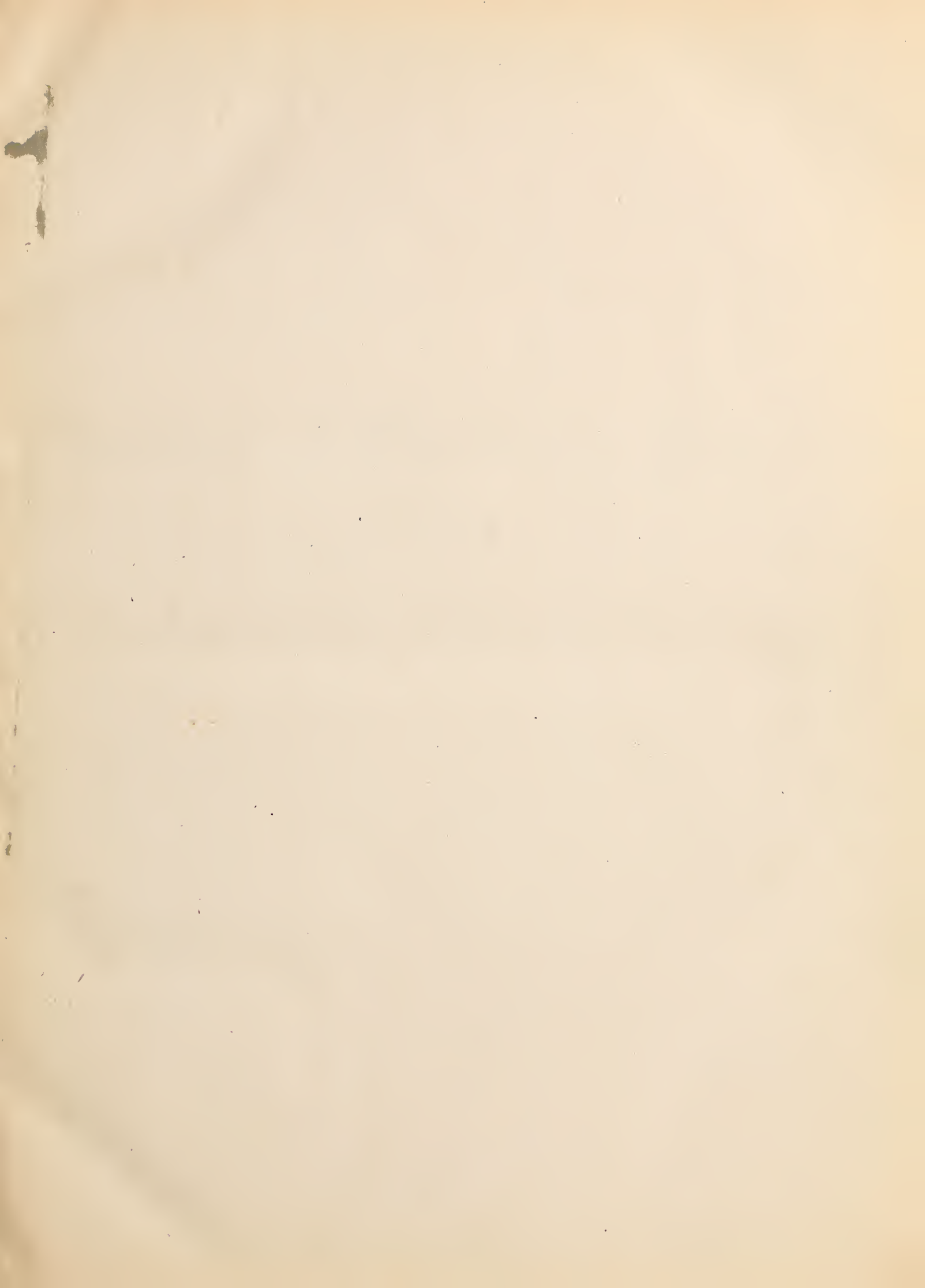




Gift of American Telephone
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Massachusetts Institute
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THE TELEGRAPHER:

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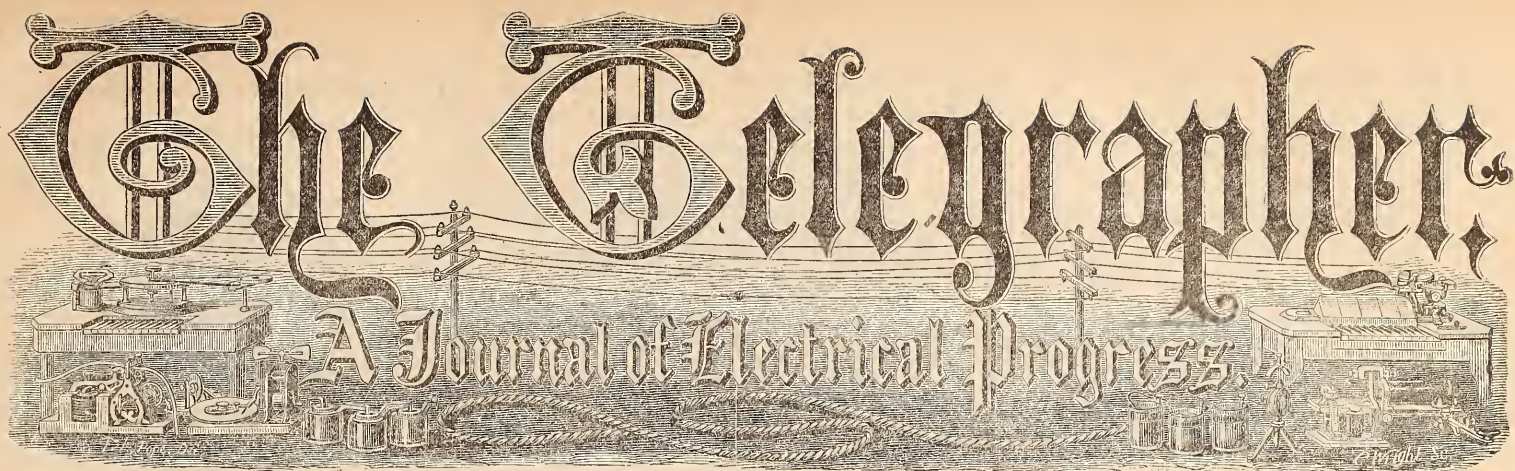
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, January 3, 1874.

Whole No. 390

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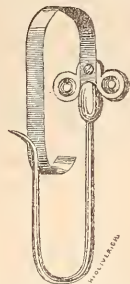
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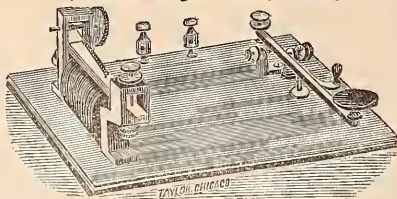
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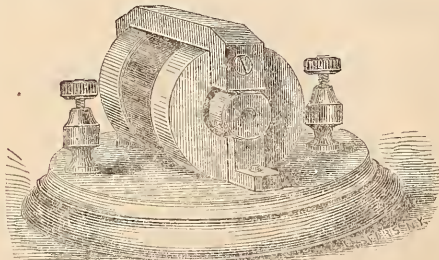
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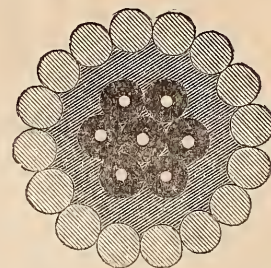
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A JOURNAL OF
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SATURDAY, JANUARY 3, 1874.

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Original Articles.

The Elementary Principles of Electrical Measurement.

By F. L. POPE.

Introductory.

THE foundation of all exact knowledge rests primarily upon the comparison of one quantity with another, or, to speak perhaps more accurately, upon the comparison of unknown with known quantities. When experimental researches are conducted by single individuals, the absolute value of the quantities dealt with are usually immaterial, but if a number of persons are employed in investigating the same class of phenomena, it becomes necessary that they should have a mutual understanding of the units and methods of measurement to be employed. The object of the present treatise is to assist the student in obtaining a clear understanding of the principles and standards employed in making electrical measurements.

The electrical phenomena which admit of measurement are four in number, viz., *electro-motive force*, *resistance*, *quantity* and *current*. These four measurable properties necessarily exist in every electric circuit.

An electric circuit, in the most usual acceptation of the term, consists essentially of a voltaic battery and of a conductor, or series of conductors, connecting its positive and negative poles. This battery may consist of a single cell or element, or of many cells; and the conductor joining its poles may be of any length, from an inch or two to many hundreds of miles, but the essential features of the circuit in either case are precisely the same.

Before entering upon the subject of electrical measurement, it is necessary that the student should understand the precise meaning of the terms used to denote the four measurable qualities of the electric circuit.

Electro-motive Force.

This may be defined as the immediate force which produces an electric current, or, in other words, the power which a voltaic cell, or other generator of electricity, possesses of causing a transfer or flow of a certain quantity of electricity. It does not depend in the slightest degree upon the size or form of the cell, but principally upon the kind of metals of which the battery is composed, and to a less extent upon the nature of the exciting solution in which the metals are immersed.

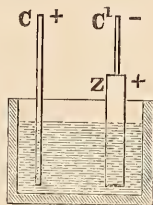
This may be easily proved by the following interesting and instructive experiment: Procure a common toy tumbler an inch and a half high, and construct a miniature Daniell's cell with it by bending a piece of sheet zinc into a cylinder of such size as to just go within the tumbler. Make a porous cell of the bowl of a common clay tobacco pipe, with the stem broken off and the opening at the bottom closed by a bit of wax or tallow. Bend a piece of copper wire into a spiral, of such size as to go within the pipe bowl, which is to be filled with powdered sulphate of copper or blue vitriol. A wire soldered to the zinc cylinder forms the other pole of the battery. Fill the tumbler and the pipe bowl with warm water. Now connect this miniature cell in circuit with a full size Daniell's cell, so that the two batteries oppose each other. By placing a galvanometer in circuit it will be found that not the slightest current will pass, showing that the electro-motive force of the small cell is exactly equal to that of the large one.

The existence of an electro-motive force necessarily involves a certain electrical condition, which is termed by recent writers on the subject a *difference of potential*. Although the idea expressed by this term is a very simple one, it is nevertheless somewhat difficult to translate it into words so as to be easily understood. In fact, the terms *electro-motive force* and *difference of potential* are often employed indiscriminately by writers on electricity. They are not, strictly speaking, identical, although neither can exist without the other. Perhaps the matter may be rendered clearer by an illustration.

If plates of two different metals (as the copper C and zinc Z in fig. 1) be immersed in water contained in a glass vessel, and a copper wire, C', be joined to the zinc Z, C will become charged with *positive* and C' with

negative electricity, and the difference in the electrical condition of these poles, as they are termed, of the voltaic cell or element thus formed, is their *difference of potential*.

Now if C and C' were united by a wire, that wire would be traversed by an electric current, and the strength of this current would be strictly proportional to the difference of potential between the poles before they were joined. The electricity existing in C and C' before they are connected by the wire is said to be in a *static* condition. When traversing the wire it is said to be in a *dynamic* condition—that is, in motion. Now, as the strength of the dynamical current is always strictly proportional to the difference of potential existing between the two statically charged points, it follows that the static charge becomes a measure of the dynamical action. Electricity at rest bears a definite relation to electricity in motion. Similarly, the difference of potential existing between C and C' is always strictly in proportion to the electro-motive force of the cell or element, and, in fact, may be said to be caused thereby. The difference of potential, therefore, may be said to be that difference of electrical



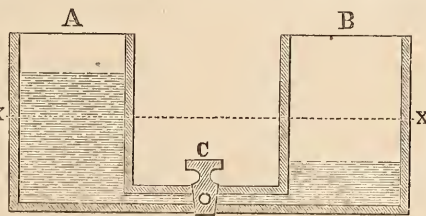
(Fig. 1.)

condition between two points by virtue of which a current tends to flow from one to the other when they are united by a conductor. The existence or continuance of the flow of a current of electricity from one point to another consequently depends solely upon the difference of potential between the two points.

Probably it would not be incorrect to say that an electro-motive force causes a difference of potential between two points, and this difference of potential in turn gives rise to a current whenever the two points are connected by a conductor.

This may, perhaps, be rendered clearer by means of a certain analogy which exists between the action of electricity and that of water.

Suppose we have two vessels of equal size and capacity, A and B, fig. 2, connected by an horizontal pipe, C, provided with a closed stop-cock. Now let such a quantity of water be put into each vessel that the surface of the water in A shall be the same distance above the line X X that the surface of the water in B is below it. The difference between the level of the water in A and in B may be termed their difference in potential. The two bodies of water are in a condition corresponding to that of the electricity in the cell shown in figure 1. Now, if we open the stop-cock (which corresponds to the act of joining C and C' in fig. 1 by a wire), a current will flow through the pipe C. The greater the difference of level between A and B the more rapidly and forcibly will the water pass through C. When the water in both vessels has



(Fig. 2.)

reached the same level—that of the line X X—the flow will cease, because there is no longer any difference of potential. The line X X, therefore, may be termed the zero of potential, and the original level in A which was higher than this line represents a positive potential, while the lower level in B in the same way represents a negative potential.

Now let us suppose that an apparatus is set at work pumping water from B into A. This would tend to lower the water in B and at the same time raise it an equal amount in A, or, in other words, to maintain a difference in potential between the two vessels. This pumping apparatus corresponds to the electro-motive force and the difference in potential maintained between A and B, and consequently the amount of water that will thereby be caused to pass through C in a given time depends entirely upon the energy of its action, and is of course directly proportional thereto.

It will also be obvious that the amount of water flowing through C depends upon the *difference* of level between A and B, and not at all upon the absolute level, which may be arbitrarily assumed at pleasure. For instance, the zero line X X might be assumed as

the mean level of the sea. In precisely the same manner the potential of the earth is assumed as the zero of electrical potential, merely as a matter of convenience in electrical work, and therefore, when we say that a given point has a certain positive or negative potential, we mean that its potential is so much greater or less than that of the earth.

Resistance.

All known substances, whether solid or liquid, oppose a greater or less *resistance* to the passage of an electric current through them, when they form part of an electric circuit, by which it is to be understood that when two bodies having a different electrical potential are connected by any material whatever, the quantity of electricity produced occupies a certain *time* in passing between them. Thus, if a certain difference of potential between two points is maintained by means of a constant electro-motive force, and these two points are joined by a conductor, as before explained, it is found that, by modifying the form or the material of the conductor, the transfer of a given quantity of electricity may be made to take place in very different times. The quality of a conductor, by virtue of which it prevents the transfer of more than a certain quantity of electricity in a given time, is called its electrical *resistance*.

Returning to our illustration by means of the flow of water, as shown in fig. 2, if the pipe C were reduced to one half its original capacity, its resistance would be doubled. It would then take exactly twice as long as before (leaving friction out of the question) for a given quantity of water to be transferred from A to B, provided the other conditions remained unchanged.

Electrical resistance is a property that differs very widely in different substances. The best conductor known is probably pure silver. One of the worst is gutta serena, the resistance of which is no less than 850,000,000,000,000,000 times as great as that of pure silver. Substances usually termed insulators are merely those having a very great resistance. The terms conductor and insulator are, therefore, entirely relative and not absolute, and it would, perhaps, be as well for the student to consider all bodies in the light of conductors having a greater or a less resistance, as the case may be, which will materially assist him in forming a clear and distinct conception of the nature of electrical action.

The resistance of an electric circuit is partly within the battery itself, and partly in that portion of the circuit outside the battery.

Quantity.

Much confusion of ideas has arisen from the loose and indefinite sense in which the term quantity has been used by different writers on electricity. A certain quantity of electricity means exactly the same thing as a certain quantity of anything else, that is, a given amount of it. In the combination shown in fig. 1, it was explained that a current of electricity would flow between the poles C and C', when these were joined by a conductor. This current of electricity arises from the action of the electro-motive force, and is supposed to be maintained by the chemical combination of the zinc with the oxygen of the water, the zinc being consumed exactly in proportion to the amount of electricity developed. Therefore, we may, for the purposes of this explanation, regard the electricity as a component part of the zinc, which is set free when the latter combines with oxygen. We may conceive, then, that the zinc plate of a battery contains a certain definite *quantity* of electricity, the same as the reservoir or vessel A. Figure 2 contains a definite quantity of water above the line X X. Now, the less the resistance of the pipe C, the greater will be the quantity of water which will pass through it in a given time, and the sooner will the water in A be reduced to the level of X X. Similarly, in a voltaic battery, the greater the amount of current traversing the conductor joining its poles in *given time*, the sooner will the original quantity of electricity (which we may regard as having been stored up in the zinc) be exhausted.

Current.

From what has been said, it will readily be understood that current is simply the quantity of electricity that passes through a given conductor or circuit in a given time. To avoid circumlocution, the direction of a current is assumed to be from a higher to a lower potential, and is usually spoken of as if this were really the case. Actually it is the recombining of the two opposite or positive and negative electricities, which have been separated by an electro-motive force, and, therefore, strictly speaking, may be said to flow as much in one direction as in the other.

The strength of a constant current in any circuit—that is to say, the quantity of electricity that passes in a given time—is equal at every point in the circuit. This uniform current throughout the circuit is not influenced in the smallest degree, either by differences in the resistance of different parts, or by differences in the material of which the circuit is composed. The distinction of "quantity" and "intensity" currents, formerly in vogue among electricians, is entirely a fal-

lacious one. There is only one kind of current, and that is a current of greater or less magnitude or strength, by which we understood nothing more nor less than the simple fact that it conveys a certain definite quantity of electricity past a given point in a given time. Here, once again, we may refer to our illustration of the water flowing in the pipe C, fig. 2. Suppose this pipe to be replaced by a series of pipes of various diameters, all of course filled with water, the current of water from A to B will flow uniformly through all of them. Precisely the same quantity of water per second will flow through each section of the pipe, whatever its diameter may be. It is true that the velocity of the water varies in proportion to the diameter of the different sections, but the current is uniform throughout, in the sense that it is a current of so many gallons per second.

The Government and the Telegraphs.

We stated a short time since (Oct. 4th, 1873) that the railway companies had still some very large claims upon the Government, arising out of the purchase of the telegraphs by the State, and at that time not less than forty-one claims were unsettled. Twelve of the claims of the largest amounts have been submitted to arbitration, including the North-Eastern, Midland, Lancashire and Yorkshire, Great Eastern, London and South Western, Great Northern, North London, Ulster, Metropolitan, Metropolitan District, Metropolitan, Hammersmith and City, and Metropolitan and St. John's Wood. The latest returns to Parliament show that the sum paid for taking over the telegraphs was £5,847,347. It is probable that when the whole of the claims are disposed of, the cost to the country will not be far short of ten or twelve millions. With regard to the claim of the Lancashire and Yorkshire and other lines, we find the following in the *Western Morning News*:

"An error of enormous magnitude has been discovered in the Government telegraph accounts. Instead of purchasing, as was supposed, a freehold and absolute title, the Government finds that it purchased the leasehold only from the telegraph companies, whose rights were bought up in many instances. The telegraph lines were leased from the railway companies, and what they sold was merely a lease of them. The railway companies are represented as being now engaged in preparing their claims. Some of these, it appears, are uncomfortably large. The claim of the Lancashire and Yorkshire Railway for the telegraph, which the Government fondly imagined it had purchased from the Magnetic Company, amounts to £950,000. The matter is to be referred to two arbitrators—Mr. Weaver, secretary of one of the telegraph companies, on the part of the Government, and Sir John Hawkshaw, on the part of the Lancashire and Yorkshire Railway. Sir John Karslake is to be umpire. The approach of an arbitration of such public interest and importance, which is thus alluded to, can scarcely, however, be fairly called an error, nor is it possible that, in purchasing the rights of the telegraph companies, the Government imagined itself to be acquiring the whole of the privileges connected with telegraphs in the country. The Telegraph Act, 1868, after giving powers to purchase the undertakings of telegraph companies, goes on to recite that the railway companies on their part are either owners of telegraphs, or they have contracts with telegraph companies whose apparatus is placed in the stations and along the railways and canals of the railway companies. Powers are, therefore, given in this Act of 1868 to the Postmaster General to take the place of the telegraph companies in such contracts with the railway companies, and to pay the railway companies compensation, either to be agreed upon or to be fixed by arbitrators, for the loss of present and reversionary gains. The Lancashire and Yorkshire Company is mentioned by name in this Act as one of the railway companies with which arrangements will have to be made, and no agreement having been come to, although negotiations have been going on ever since the passing of the Act, the time has now come when a decision will have to be arrived at by arbitration, as provided in the Act, and before Sir John Karslake as umpire. Eminent counsel have been retained on both sides. The Marquis of Salisbury, as umpire, has already pronounced on a somewhat similar claim, involving, however, a much smaller amount than the sum to which, on the part of the Lancashire and Yorkshire Company, it will probably be contended that company is entitled. The Act of 1869 estimated £700,000 as a sufficient sum to cover the whole expenses of the Government in this part of the transfer of the telegraphs. The Lancashire and Yorkshire Company alone now demand a million or more. But it will be obvious that neither the Government nor the company is a fair judge of its own cause, and the public will look with interest for the decision of Sir John Karslake and his experienced assessors. The arbitration will involve difficult and intricate matters of account."—*The Railway News*.

West India and Panama Telegraph.

THE committee of shareholders appointed at the annual meeting of the shareholders of the company on the 17th November, 1873, report that their long deferred hope of the completion of the telegraph system of the company is now likely to be realized, the steamships *Minia* and *Kangaroo*, in the service of the Telegraph Construction and Maintenance Company, freighted with cables for duplicating the lines between Jamaica and Porto Rico, and Dominica and Martinique, having sailed on the 2d of December, and the Investigator, in the service of the same company, having sailed on the 8th of December, to repair the broken cable of the Cuba Telegraph Company. After referring at some length to the failures and shortcomings of the past, which have resulted in the unquestionable difficulties of the present, they state that they "cannot but express their regret that more decided action was not taken by the board immediately after the expiration of the eleven months named in the contract for the laying of the cables, and that, previously to the commencement of litigation, more vigorous efforts were not made to bring about an amicable adjustment or arbitration by commercial men. The committee have, as far as time would permit, looked through the voluminous proceedings in this unfortunate Chancery suit, and they came reluctantly to the opinion that it was unadvisable, in the interests of this company, to approach the defendants with a view to an amicable settlement; but, in saying this, they are not by any means without hope that, under a newly constructed board, negotiations may not be advantageously opened with a view to an amicable adjustment of differences. The committee cannot but suspect that, in the long continued discussions and correspondence which have taken place between the directors and officers of this company and the India Rubber Company, feelings have been excited not favorable to the amicable solution of the grave differences existing; and, entertaining this opinion, the committee have come to the conclusion that it is desirable that some members of the present board should retire, and that some gentlemen of larger practical experience in the management of existing submarine telegraph companies should be invited to take seats at the board."

Remarkable Operations.

B. FRANKLIN made his name famous when he flew his kite and brought down lightning from the clouds, which had been flying around without paying its way. Now we not only flash through on wires, but science has grappled with electricity and used it to perform miracles. Our readers will remember that when Gen. Kilpatrick returned from Chili, three years since, he had a remarkable operation performed by a physician in New York, who removed a large fleshy formation from the General's neck by filling it full of needles and then attaching a galvanic battery to it. Ten minutes after the current of electricity was let on the bunch had entirely disappeared. A remarkable operation was performed by a Whitehall physician a few days ago. A gentleman who had been suffering from a superabundance of adipose tissue consulted a physician, asking for relief from his burden. The gentleman consented, and, with the medical practitioner, entered the telegraph office at this place. The fat man was requested to remove his coat and vest, after which the physician surrounded him with wires, attaching the ends to a powerful galvanic battery. At a signal from the doctor, Manager W. B. Eddy let on the current. The patient writhed and twisted when he felt the current passing around him, but he stood it like a martyr. Presently he began to shrink; he grew smaller and smaller and smaller; his clothing hung in bags about his fast diminishing form. The doctor felt much pleased at the result of his experiment, while the formerly fat man's joy was very great, although he seemed to be suffering the worst pain. All of a sudden there was heard a loud clicking at the instrument, as if Pandemonium's great hall had been let loose. The operator sprang quickly to answer the call. He ascertained it was from the New York office. He quickly asked, "What's up?" An answer came back as if some demon was at the other end of the wire: "Cut off your wires quick—you are filling the New York office with soap grease!"

The Way the Cable Talks.

AN operator sits at a table in a room darkened by a curtain. On his left hand stands a little instrument, named the "reflecting galvanometer," the invention of Sir William Thompson, without which Atlantic telegraphy would be a slow process—not exceeding two or three words per minute, instead of eighteen or twenty, the present rate.

This delicate instrument consists of a tiny magnet, and a small mirror swinging on a silk thread, the two together weighing but a few grains. The electric current, passing along the wire from Valencia, deflects

the magnet to and fro. The mirror reflects a spot of light on to a scale, in a box placed at the operator's right hand, where, by its oscillation, the spot of light indicates the slight movements of the magnet, which are too slight to be directly seen.

This little swinging magnet follows every change in the received current, and every change, great or small, produces a corresponding oscillation of the spot of light on the scale. A code of signals is arranged by which the movement of the spot of light is made to indicate the letters of the alphabet.

When receiving a message from Valencia, the operator watches the movement of the little speck, which keeps dancing about over the scale on his right. To his practiced eye each movement of the spot of light represents a letter of the alphabet, and its seemingly fantastic motions are spelling out the intelligence which the pulsing of the electric current are transmitting between the two hemispheres. It is truly marvellous to note how rapidly the experienced operator disentangles the irregular oscillations of the little speck of light into the letters and words which they represent.

Christmas Greeting to a Telegraph Manager.

A LOOP extends from the main office of the Southern and Atlantic telegraph office at Charleston, S. C., to the sleeping room of the manager, Mr. L. E. C. Moore. At twelve o'clock, Christmas Eve, he heard his call, "Em," and, upon answering, received the following Christmas greeting, from the employés in the office:

"Main office, S. and A. Telegraph Co., Charleston, S. C., Christmas Eve, 1873. To L. E. C. Moore, manager.—The employés of your office extend to you and your family a happy Christmas greeting, and hope that the 'circuit' of your happiness may be long, and your course of life so 'adjusted' as to catch every 'dot' of pleasure; that the 'sympathy' that now exists between us may never be interrupted by any 'ground' of discord; that the strong 'battery' of friendship now existing may never lose its 'insulation'; that 'escape' of all trouble may ever be your fortune. May our, each and every 'manipulation' be 'conductive' of your popularity as our manager; may you and yours 'dash' through life smoothly and steadily; may the 'space' of time be long extended ere our 'connection' be severed, and may nothing ever 'stick' in the friendly intercourse existing between us, is the wish of your employés.

J. C. DUGGAN, Chief Operator.
A. L. HAYNES, Night Manager.
A. J. WRIGHT, Operator.
J. P. FINNIGAN, "
J. PHILLIP RIVERS, "
THOS. F. SEATERY, "
ALVA B. GREEN, Clerk.
J. L. SMITH, Lineman.
S. R. BELL, "
JNO. W. ROBINSON, } Messengers."
H. E. PRIOR, }

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Telegraphers Better than they are Represented.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE that there is considerable said through the columns of THE TELEGRAPHER in regard to the morals of telegraphers, and how they are looked upon in social circles. Some of the writers are afraid that matters are growing worse instead of improving, and that operators are, as a general thing, a depraved and almost an abandoned class of men. Now I think these fears are not only unnecessary but groundless. Speaking of the fraternity at large, it is true that there are black sheep in all flocks. This is true in church and state, and always has been and always will be to the end of time. Our Saviour, when upon earth, chose twelve disciples, and Christ himself said, "Have I not chosen twelve, and one of them is a devil?" But Christ also said, "Let the wheat and the tares grow together, but while ye root up the tares ye also root up the wheat."

Now I have met a great many telegraphers, and formed their acquaintance, and been associated with them, and I must say that they are not the worst men; but, as a general rule, a more generous, whole souled class of men you cannot find. They are always ready to extend the helping hand whenever required. The only mystery to me is that telegraphers are not more dissipated and reckless than they are, for most of them have left home and home influence when quite young, and perhaps just at the very time they most

needed the kind admonitions of careful parents—who they were moulding a life character. They have left all this; and how many, many sweet influences are connected with a Christian home! God only knows the influence of a mother. What heart does not thrill with joy as they remember a kind and loving mother, who in their youth taught them their first prayer, and told them of heaven and a Saviour, who had gone to prepare a home for them, if good children? Then how that same gentle, loving mother would imprint the good night kiss upon the cheek. Oh! who can tell the influence of a Christian mother? I well remember, when I left the old homestead, how my mother bade me farewell with tears streaming down her cheeks, and bade me remember the advice and instruction received from her.

Now this is not all romance, as many a one who will read this can testify, and perhaps call to remembrance home, thinking of that gentle, loving mother who so often soothed their boyish sorrows. Perhaps she now sleeps in the silent churchyard, and her spirit has gone home to its eternal resting place. Now, who will not think it strange, upon reflection, when duly considering all the many privileges and home counsels that telegraphers are deprived of, that they are no worse than they are? And, as I think back on my own experience, I have great reason to thank God for a pious mother. Telegraphers are, to use a vulgar expression, kicked from pillar to post, and the public do not, in the way they should, appreciate the services rendered them by the fraternity. They look upon them as a kind of necessary evil, and generally treat them accordingly; but we can bear all this, for ours is a noble calling, and we have the consciousness of doing a noble work, and if our reward is not just upon earth, we are assured that we are seen by our Heavenly Father in secret, and shall be rewarded openly by him; and, if that be not until the great and final day, let us not despair, but perform well and faithfully our part in life.

Let some one else speak upon this matter. It can be made interesting. MELVILLE.

The Bible, and the Invention of the Telegraph.

TO THE EDITOR OF THE TELEGRAPHER.

SOME of your correspondents have been going back in the history of telegraphy for items of interest. Since they have started on the backward course, I would like to cite them to where we read in Nahum (ii. 4) of chariots seeming like torches, and that they should run like the lightning, with terrible collisions in the highways; and earlier still, by nearly a thousand years (Job xxxviii, 35), inquire if the lightning could be sent to convey intelligence? Three millenials pass away and Morse responds "it can;" and to-day thousands of operators throughout our land exclaim with Morse, "it can."

In the language of another, we can say, "God has shorn the lightning of its terror and laid it powerless in our hands." We should remember "we operators are the mediums of one of the noblest uses that science ever whispered into the ear of man." When we see how rapidly this art has developed we cannot help but admire its inventor. There is no name that the American people more deeply revere than that of Morse. Magically, by the wonderful power of telegraphy, months have been reduced to seconds, time ignored, space powerless, man speaks to man in words of living eloquence, though oceans separate them. High mountains and broad rivers constitute no obstacle in the path of this irresistible force. Everything yields to its potent sway, and still stands aghast with wonder, contemplating in amazement the mighty works of fellow men, and exclaiming, "all is possible." It is, indeed, the arteries through which beats the great pulse of humanity—the public highway of thought.

S. L. C.

Consolidation of Competing Telegraph Lines the Only Safety.

TO THE EDITOR OF THE TELEGRAPHER.

THE consolidation of the Pacific and Atlantic Telegraph lines with the Western Union, although not unexpected, should awaken the managers of the companies competing with the Western Union to the necessity which exists for taking measures to consolidate their interests and to protect themselves against a similar fate. Only in such a consolidation can there be safety, and it is imperatively demanded by their own interests and that of the public whom they serve. It is the policy of the Western Union Company to absorb competing companies one by one—and while they remain separated, and to a more or less extent divided in their interests, they cannot compete upon anything like equal terms with that organization.

The Atlantic and Pacific Company is the leading telegraph organization outside of the Western Union combination, and it would seem to be the part of wisdom for the managers of that company to take the lead in the movement towards such a consolidation.

The defection of the Pacific and Atlantic Company renders it necessary that the territory which it covered should be occupied by new competing lines with the least possible delay, and this can be done if the existing companies will unite their energies and resources in practically one organization.

This course has been urged for years in THE TELEGRAPHER, and its recommendations in the premises have met with general approval, but it has been understood that hitherto the Pacific and Atlantic Company has stood in the way of any advantageous arrangement. That obstacle is now removed, and it is to be hoped that we shall soon witness effective action towards a consummation which all who have the permanence of telegraphic competition at heart must desire. CONSOLIDATION.

How the Western Union Company Encourage Inventors.

TO THE EDITOR OF THE TELEGRAPHER.

THE last number of the official organ contains an elaborate illustrated description of the Milliken Repeater, filling two pages. This amount of space, however, was not sufficient to allow the writer room enough to state that although the Western Union Company are using between one and two hundred of these repeaters on their lines, yet, so far as heard from, Mr. Milliken has never received a dollar of compensation from that company for the use of his invention; yet the actual money value of it to them since its adoption must amount to a great many thousands of dollars. This is paralleled by the case of Cushman, the inventor of the well known switch-board, of which hundreds and hundreds have been used by the same company, and no compensation was ever made either to the inventor or his destitute widow. When they do attempt to reward an inventor, they seem to be equally unfortunate; for the considerable sum of money paid for the duplex patents, "\$19,258 on account" (vide Mr. Orton's report), to all appearances was paid to the wrong man, as almost every point about the latter invention of any practical value, and which was not free to public use, was anticipated in Farmer's patent of 1858, which has recently been extended for seven years. They are perfectly willing, however, to pay a large sum for a fraudulent patent like that of Page, not for legitimate business purposes, but as an engine of oppression, for the purpose of crushing any one who ventures to make use of electricity in any way without paying tribute to their monopoly. To hear some of their officials talk, one would think a man couldn't be killed by a stroke of lightning without liability of having a royalty collected from his heirs. This is the way wealthy corporations reward worthy inventors. JUSTITIA.

A Response to Nettie Bronson.

TO THE EDITOR OF THE TELEGRAPHER.

THAT spicy little note from "Nettie Bronson," in your last issue, was really so interesting that I shall have to ask of you a small space to express my admiration.

Although never taking any particular interest in the question as to the practicability of admitting ladies into the profession, I have never been able to see why, if they have the proper qualifications, those of the fair sex should not have the same privilege to the profession as we of the more unrefined persuasion. And "Nettie's" idea of our sitting with our feet on the table, etc., almost makes me believe that we are a sort of a clownish set; but I hope she does not have as poor an opinion of all of us as her description of the "gentleman" (I should say not a very dear friend) to whom she applied would seem to imply. If she does, farewell to all my hopes of reconciliation.

Not long since I was coworker in an office with a very nice young lady, and the pleasure of smoking, with all its attendant gratifications, had to be dispensed with; but if Nettie could have seen with what eagerness a pipe was grasped, as soon as the lady left the office, I think she would have admired my martyrdom in foregoing such a pleasure; yet, I assure her, I made no complaint, and, in fact, think I was quite cheerful.

I am afraid that Nettie felt a little "sour" when she wrote that letter; and, no doubt, if at that time any poor unfortunate "frite gerse" had come in her way, on his devoted ears would have fallen, with appalling distinctness, "You plug!" for I can say to her that I have seen those of our sister operators who were quite emphatic when their anger was aroused.

But as I should certainly expect to be withered at once by Nettie's sarcasm, I hereby disclaim any idea of criticism, and announce myself in perfect sympathy with her. Nettie presumes she should prefer a gentleman student. Allow me to say that this, strange as it may seem, strikes me as being her finest point, especially as she shows such a Christian spirit in her willingness to help others.

I hope, if she has not an office now, she soon will

have. Let him who dare say nay, and I shall immediately renounce all my knowledge of telegraphing and apply for a position as student. Will Nettie look with favor on the application? FRANKIE.

Exit of the Pacific and Atlantic Telegraph Company.

PITTSBURG, PA., December 28.

TO THE EDITOR OF THE TELEGRAPHER.

"THE king is dead, long live the king." Last night at 6 o'clock the wires were cut off from the office of the Pacific and Atlantic Telegraph Company in this city and transferred to the Western Union office. Everything had gone on in the usual way until the moment of closing, and as we rose from our tables as the wires were cut off at the switch-boards by Mr. Geo. Wynne, the veteran repairman, we all felt as though parting from old friends for the last time. For the last hour or so before six o'clock the wires were almost entirely occupied in farewell talks between the "boys" at the *termini*, and along the line of the several wires.

Messages expressive of mutual regret at parting, and wishes for future prosperity, were exchanged between chief operators Long, at Chicago, and Hamilton, at this place, on behalf of their respective forces.

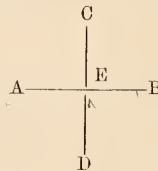
We all felt sad, and the impressive "R. A." was observed to draw forth a huge red silk handkerchief and weep; he then jammed his hat down over his eyes and made for the door, fearful lest his emotion should be seen.

The force here consisted of Messrs. Geo. A. Hamilton, chief operator (day), M. M. Prescott, chief operator (night), R. W. Ledwith, assistant chief operator (day), and Messrs. Fetch, Myers, Pollock, Byrne, Muse, Barclay and Matthias, operators, all of whom, it is understood, are to be transferred, for the present at least, to the Western Union office. M. S.

Another Problem.

TO THE EDITOR OF THE TELEGRAPHER.

SUPPOSING four points, A, B, C and D, to be connected by telegraph lines, each being at an equal distance, say 10 miles from the point E, there being available only just enough material to construct 40 miles of single wire line, how can it be arranged so that each office can work direct with either of the others, without the use either of loops or of repeaters?



The diagram shows the arrangement of wires and stations above described. B.

Answer to Correspondent.

OCCASIONAL.—Your items of the 10th ult. were accidentally overlooked last week. Sorry, and will try not to have it occur again.

Personals.

Mr. FRANK N. DIAMANT has resigned his position of assistant agent and operator of the North Pennsylvania, and North East Penn. Railroad at Abington, Pa., and accepted a position with the Lehigh Valley Railroad at Tunkhannock, Pa.

Mr. J. B. SHUTE has accepted the position of agent and operator at Abington, Pa., resigned by Mr. DIAMANT. Mr. SHUTE was a former resident of California, and his many friends on the Pacific Coast will no doubt be pleased to hear from him.

Mr. JOHN MURPHY, operator in the general agent's office of the North Penn. R. R. at Philadelphia, Pa., has been absent on leave of absence to his home in Richmond, Va.

Mr. GEO. H. WILSON has been appointed agent and operator of the North Penn. R. R. at Hellertown, Pa.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended December 6, 1873, was 339,099—an increase on the corresponding week of 1872 of 53,453.

The total traffic receipts of the Great Northern Telegraph for the month of November amounted to 314,573 fr. (£12,583), and for the same month in 1872 to 229,187 fr. (£9,167), showing an increase of £3,416. The receipts on the European lines amounted to 166,563 fr., against 124,915 fr., and on the China and Japan lines to 143,010 fr., against 104,272 fr.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

SATURDAY, JANUARY 3, 1874.

THE TELEGRAPHER:

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THE TELEGRAPHER.

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DEVOTED TO THE INTERESTS OF THE

Telegraphic Fraternity and the Advancement of Electrical Science and the Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of THE TELEGRAPHER will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The TENTH VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the

TELEGRAPHIC FRATERNITY,

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Remittances for subscriptions may be made by mail, by post-office order or registered letter, at the risk of the Publisher, but no responsibility will be assumed for money sent without such precaution. On remittances of not less than FIVE DOLLARS the cost of the order or registration may be deducted from the amount.

Advertisements are solicited, and will be inserted at reasonable rates; but no Advertisement will be inserted for less than ONE DOLLAR per insertion.

All communications relating to or intended for THE TELEGRAPHER must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503,) NEW YORK.

The New Year and the New Volume of The Telegrapher.

A NEW YEAR has dawned upon the world, and will be in its third day when these lines reach our readers. The Christmas and New Year festivities have nearly closed, and it is time to address ourselves once more to the serious every day business of life. The customary compliments and greetings have been exchanged, and the New Year is with us, with what of pleasure or pain, joy or sorrow, success or failure, will be duly solved by the swiftly passing days, weeks and months which, in due course, shall bring us to 1875.

With the New Year THE TELEGRAPHER commences its TENTH VOLUME, and will, we trust, continue to be a welcome weekly visitor to all of its old friends and subscribers and to many new ones. Its prospects for the future are apparently as good or better than ever before in its history, and its usefulness, we hope, will be even more marked than at any previous time since it was first established. The volume which has just been closed, although not in all respects what we had hoped to make it, still has been, we think, a decided improvement upon those which have preceded it. We are under obligation to many friends for their valuable contributions to its columns during the year, and are assured of the continuance of their favors, and of contributions from others which will have a tendency to increase the value and interest of the paper. We have no special promises to make in regard to THE TELEGRAPHER, further than that all its valuable and interesting features will be continued, and such improvements and additions made, from time to time, as additional experience and more ample facilities and means shall render possible and practicable.

The evidences that we are constantly receiving of fuller appreciation, and increasing and widening interest in THE TELEGRAPHER, are very gratifying, and stimulate us to renewed efforts to make it worthy of the high position which it has obtained as an authority in electrical science and telegraphic art, and as the only independent and reliable telegraphic journal in this country. Representing as it does the practical telegraphers of the country, wherever known and by whom employed, and not crippled by complication with any telegraph company, combination or clique, it can afford to be a really independent publication—and, as such, it is our especial pride to maintain it. It is for the telegraphers themselves, whom it represents, to say how long its present policy and character shall be maintained. If they continue to support it by their subscriptions and influence it shall not be found wanting. It has passed through some apparently dark days, but, we believe, has never forfeited or lost the confidence of the practical telegraphers of the country.

We had hoped to still further enlarge the paper with the commencement of the new volume, but have deemed it advisable not to do so at present. Such enlargement involves not only considerable increase of the cost of publication, but also of labor and care, which we are not in a condition to bestow just now. If the patronage received shall be sufficient to warrant it, and other things shall be favorable, we may make this enlargement during the present volume. We can truly say that the prospects of THE TELEGRAPHER were never more encouraging than at the present time. Notwithstanding the depression in business its circulation is increasing, and of advertising we have more offered than we can find room for. All things considered, we anticipate for the new volume a success which shall equal, if not excel that of any which has preceded it. To realize this anticipation, however, we must rely upon the continued active cooperation of our telegraphic friends, who have not heretofore failed us.

In conclusion, we would ask every telegrapher, who believes that it is important to the welfare, instruction and best interests of the fraternity, that THE TELEGRAPHER, as its organ and representative, should be maintained, to use his or her influence to add to its circulation and influence. With such an active and

easily afforded cooperation, its subscription list would soon be doubled and trebled—and with increase of circulation comes increase of influence and usefulness. With thanks to the kind friends who have by their generous efforts given the new volume encouragement in the way of additional patronage, and with the compliments of the season to one and all of our readers, we now start the TENTH VOLUME OF THE TELEGRAPHER with favoring winds upon its brief, but, we hope and believe, prosperous voyage through the coming year.

The Postmaster General and the Western Union Telegraph Company.

POSTMASTER GENERAL CRESSWELL, in his efforts to induce Congress to confide to his Department the management of the telegraphs of the country, seems to be peculiarly unfortunate. Actuated by an ambition rival the fame of Mr. SCUDAMORE in England, who succeeded in securing to the Post-office and himself the administration of the telegraphs of the United Kingdom, after a severe and protracted contest with the companies that owned them, Mr. CRESSWELL entered upon the task of obtaining a similar triumph here with great confidence, and a manifest disregard of the existing telegraph interests. He was not long in discovering, however, that the undertaking was a much more arduous one than he had calculated upon, and that Congress did not incline much to the course which he recommended, and which he had, by elaborately prepared, but, as it was found when analyzed, fallacious and unreliable statistics, endeavored to show would prove a popular and profitable one. President ORTON and the Western Union Telegraph Company entered the lists against the proposed confiscation of their property and interests zealously and successfully, and, as a consequence, our worthy Postmaster General lost his temper, and, in the report which he presented at the opening of the present session of Congress, he attacked both the Company and Mr. ORTON personally in a savage and most unusual manner. To this Mr. ORTON has just issued a reply, which caustically reviews Mr. CRESSWELL's report, and puts him in a most uncomfortable and unenviable position. The length of this reply, which fills a pamphlet of 38 pages, precludes its publication entire in our columns, but we will endeavor to give briefly the more important features of it.

The Postmaster General is unfortunate in his treatment of the subject. He is so evidently unreasonable, ill tempered, inconsistent and illogical, as to damage his own case, and prevent his suggestions and recommendations having the weight and influence desired. It is evident to him, as to everybody else, that the proposition for a Government telegraph monopoly, instead of gaining, loses ground, and that there is no reasonable prospect of success; but he apparently desires to do as much damage as possible to the party or parties whom he regards as largely responsible for his ill success.

Mr. ORTON's reply is in the form of a communication addressed to the Postmaster General personally. The communication gives the following explanation of the reasons which have impelled such an unusual course on the part of Mr. ORTON, who says:

"I have before me an official copy of the Report of the Postmaster General for the fiscal year ending June 30, 1873, which contains statements concerning the policy and management of the Western Union Telegraph Company, including allusions to myself, which are so erroneous, unjust and personal, that it seems incredible they should have been made by a Cabinet Minister in an official communication to the President for transmission to the Congress of the United States.

"That it is an unusual proceeding for a private citizen to publicly address a communication to a Cabinet Minister upon the subject of an official report, is admitted. On the other hand, I believe it is equally unprecedented for a Cabinet officer, in a public report to the President, to select for official animadversion a business lawfully prosecuted, or a citizen who has infringed no law; and, therefore, if any justification is needed, it will be found in the extraordinary character of the paper to which this is a reply. It seems due to the owners of property whose value may be impaired by official misrepresentation, to the public, who are largely interested in the proper conduct of the telegraph business,

and also to the managers of a corporation who have been held up to public reprobation by the head of one of the most important Executive Departments of the Government, that his errors should be plainly pointed out, and the facts fully and fairly stated."

He then proceeds to give a brief history of what the Government has done for the telegraph, its whole assistance to this important interest having been comprized in an appropriation of \$30,000 to build the experimental line from Washington to Baltimore, and a subsidy of \$40,000 per year, for ten years, to the first line to California, which latter was more than repaid by the transmission of Government despatches over it without other charge. He then contrasts the munificent liberality of the Government to railroads with its niggardliness to the telegraph, showing "Hundreds of Millions of Government aid to Railroads and but thirty thousand to the Telegraph!"

He then considers the Act of 1866, which conferred certain privileges upon telegraph companies, but n return extorted from them an agreement to sell their lines to the Government, at its option, upon appraisal, at any time after five years; a contract which the telegraph companies have never repudiated, but which the Postmaster General—neither Congress nor the people giving any indication of intension of enforcing—desires repudiated, and a partial Government competition established, to depreciate and destroy the value of the property which Congress may desire hereafter to purchase.

He then proceeds to review the proposed legislation in Congress, looking to a postal telegraph. He quotes from the Report of the Postmaster General in 1872 the following paragraph:

"I am decidedly of opinion that if the people interested require a postal telegraph, it should be entirely in the hands of the Government. If, on the contrary, a postal telegraph is not so demanded, then the Government should not favor one private company to the exclusion of another, nor should it in any wise enter into competition with private enterprise."

The Report of the Postmaster General, in 1872, fixed the value of the existing telegraph property in the country at \$11,880,000, while the only estimate submitted in his report, from an expert, was that the lines could be duplicated for \$18,250,000, if the material could be imported free of duty—while Mr. ORTON asserts that the property was worth in the market not less than \$50,000,000. The Postmaster General, in the report under consideration, expresses "full confidence" in the correctness of the estimates in his previous report. The communication says:

"The Government has the right to buy the property of the Company thus assailed, and the utterance of official opinions calculated to prejudice the public mind as to its value, looks like an attempt to forestall the award of the arbitrators, and to compel the owners to accept a sum less than that to which they consider themselves entitled, rather than take the risk of inciting greater official hostility. The injustice of such a proceeding will be apparent to any one who will examine the facts."

In his report the Postmaster-General asserts that "the opposition to the postal telegraph comes almost entirely from the telegraph companies and those directly interested with them in sustaining their monopoly," and that "every intelligent, disinterested observer, who has seen the workings of the Government system abroad, gives them the decided preference."

Mr. ORTON briefly but effectually refutes both of these statements. "The press," he says, "are almost unanimously opposed to it, and there is no evidence that even a respectable minority of the people desire its assumption by the Government." These facts are evident to everybody outside of the Postmaster General's office, and it is difficult to believe that he makes the statements with an intelligent faith in their correctness.

The assertions of the Postmaster General that "under the present management the use of the telegraph by the masses of the people is almost prohibited by reason of arbitrary rates, unnecessarily high charges and a want of facilities," and that "it may, however, be regarded as settled, that while under the control of pri-

vate companies, whose chief object is to make a profit for their stockholders, and whose skill and labor are expended in efforts to advance the price of their stock, and to enforce the highest rates to which the people can be made to submit, the telegraph will never become a general medium of correspondence," are discussed at considerable length by Mr. ORTON, and their fallacy shown by statistics of the telegraph service in this country and in Europe—by which it appears that the telegraph is more generally used here than in any country in Europe, and that the rates of charges are no higher, relatively, than in countries where the telegraph is a Government system. Statistics are also given which show that, with the exception of Russia, the Government telegraphs are worked at an absolute loss; and in Russia, which made a profit of 4,000,000 francs out of its telegraph service in 1872, the average charge per message was about 5½ francs, while the present average tariff for messages in the United States is but fifty cents—about 2½ francs for a message of ten words—date, address and signature being free.

The following will no doubt be endorsed by every person familiar with the telegraph business:

"It is strictly true that the chief object of the companies is to make profit for their stockholders. It is for that purpose alone that private parties have invested capital in the telegraph business; and there is no good reason why the investors in such property, and those to whom they have entrusted its management, should be subjected to the invidious rhetoric of a Cabinet officer, more than citizens engaged in other legitimate industries; neither should their efforts to make the business remunerative and the property valuable, by lawful means, be made the subject of official condemnation. The present telegraphic facilities are adequate to meet all the demands upon them. In no other country have telegraphic facilities increased so largely, during the last few years, as in the United States. This increase has not only kept pace with the public demand, but in many sections has anticipated it. While in other countries the cost of telegraphic extension, and in some of them a part of the cost of its operation, has been paid from the public treasury with moneys raised by taxation upon the people, in the United States the extensions have been made entirely by private capital, furnished by private citizens."

The review of the Postmaster General's statements in regard to the automatic system we have not space to consider in this article, but will consider specially hereafter. Mr. ORTON endeavors to show that the automatic system is really slower and more expensive than the Morse, but the facts do not bear out the assumptions made, as will be shown in a future article.

The Postmaster General states that "there are now but two parties in the controversy over the postal telegraph—on the one side the people, on the other the Western Union Telegraph Company."

To this special pleading Mr. ORTON says:

"It was stated early in the report that the opposition to the postal telegraph came from the telegraph companies (in the plural) and those directly interested with them in sustaining their monopoly. Further reflection appears to have induced the Postmaster General to modify this opinion—to suspend sentence upon all parties except the Western Union, and to concentrate upon that company and its officers the entire weight of his condemnation."

It might very properly have been said that in the postal telegraph scheme there are but two parties—the Postmaster General and a very limited following—and in active opposition or indifferent to it nearly the entire press of the country and almost the whole body of the people.

The Postmaster General having made serious charges against the Western Union Company and its efforts to destroy rivals, Mr. ORTON replies to these at some length and defends the company, and asserts that if its rivals have been vanquished it was "either because they did not possess the facilities requisite for doing sufficient business to enable them to pay its expenses, or because the rates they insisted upon establishing proved to be unremunerative, or because they failed to conduct their business to the satisfaction of the public."

"The charge that the Western Union Company have not scrupled to use any device which the power-

ful can employ against the weak, and failing in the open field of fair competition, have resorted to artifice, and have triumphed by making gold their weapon," is absolutely groundless, and if uttered by one less distinguished than the Postmaster General, would deserve to be characterized as a pompous slander. If published by one private individual in respect to another, it would make its author liable to an action for damages. * * It has the right to acquire a monopoly of the telegraph business by serving the public better and cheaper than any other parties are able or willing to serve it; but if it be true, as stated in the report, that its competitors have been 'vanquished' by the reduction of rates, does not that fact destroy the chief support on which the postal telegraph scheme rests? If private companies cannot pay expenses at present rates, how is it expected that the Government can make a profit at still lower rates?"

In conclusion, Mr. ORTON says:

"There only remains to be considered the recommendation of the Postmaster General, that Congress authorize the construction of lines required for the immediate establishment of the postal telegraph. Can it be that the Postmaster General expected a proposition to be seriously considered which contemplates employing public moneys, collected from the people by taxation, to set up the Government in business as the competitor of private citizens? Coming from an executive officer of a Republican Government, whose powers are defined and limited by a constitution and laws, the proposal is simply monstrous. If there were no such prohibition in the Constitution, the common sense of an intelligent people would revolt at the suggestion that private property should be taken for public use without just compensation. But to use public moneys to destroy private property by Governmental competition, would be more unjust than to take it without compensation. In the latter case its owners would lose only its value, while in the former they would make the same loss, and, in addition thereto, be obliged to contribute in taxes their *pro rata* share of the cost of its destruction. The owners of telegraph property, startled as they may well be at this extraordinary proposal, need have no apprehension of its being carried into effect. The people of the United States are intelligent and just, and the Congress they have chosen, faithfully representing them, will require the Government to show the same respect for private property and private rights that the common law requires each citizen to show to every other."

We have been obliged to pass over many points in this communication which we should be pleased to consider, and merely refer to others which deserve more extended notice. We will only add, in conclusion, that the argument is all against the Postmaster General, and that, before he again enters the lists, he had better regain his good temper, devote some further time to the consideration of the subject, and then display his acquired wisdom by letting it severely alone.

The Railroad Telegraph Operators and The Telegrapher.

WHEN, two or three years since, recognizing the importance which railroad telegraphy had assumed, we devoted special attention to railroad telegraphy and telegraphers, we did so because we considered that it was due to both. Before that time little attention had been paid to this important interest, and it had been regarded as rather a reproach than otherwise to be ranked as a "railroad telegrapher." All this has been measurably changed now, and many of the ablest electricians and practical telegraphers are engaged in the railroad telegraph service. Certainly there is no branch of telegraphy which requires more ability and reliability upon the part of the operators than that connected with the railroads of the country. Upon the ability and reliability of these persons not unfrequently depend the safety of lives and property, and they seldom fail at the critical moment. Although not generally as well paid as commercial operators, their duties are usually more arduous and their responsibilities much greater. We think that their condition is gradually improving, and if THE TELEGRAPHER can in any way aid in such improvement, its influence shall not be lacking.

The railroad telegraphers of the country have not been slow to recognize and appreciate the position taken by THE TELEGRAPHER in relation to them, and some of our most valued contributors, and no inconsiderable number of our subscribers are connected with the railroad telegraph service. We hope that both

will be increased during the coming year, and that they may be fully satisfied that THE TELEGRAPHER not only desires but intends to do them justice, and that it is not without influence in their behalf.

A Valuable Contribution.

WE would direct the special attention of our scientific readers to the valuable and instructive series of papers on The Elementary Principles of Electrical Measurement, the first of which appears in the present issue. As a complete exposition of the very latest discoveries and theories in electricity, it will be found to be a contribution of great and permanent value to the literature of the subject.

Special Notice.

THE present number of THE TELEGRAPHER—the first of Vol. X—will be sent to subscribers whose subscriptions expired with the last number of Vol. IX, whose renewal of their subscriptions has not been received. It is hoped that all who have not yet sent their renewal will do so at once, if not the paper will be discontinued after the present issue.

Back Numbers of the Telegrapher Wanted.

OUR supply of the following numbers of Volume IX of THE TELEGRAPHER is exhausted:

Numbers 342, 351 and 354.

We would be obliged to any of our friends who may have either of them to spare if they will forward them to us to complete files.

The Telegraph.

Election of Officers of the Southern and Atlantic Telegraph Company.

AT the adjourned annual meeting of the Southern and Atlantic Telegraph Company, held in this city on Wednesday, December 17, 1873, Mr. James R. Crenshaw was reelected President of the company for the ensuing year. At a meeting of the directors of the company (whose election was noted in THE TELEGRAPHER of December 20th last) the following elections were made: Mr. Charles W. Blossom, Vice-President; Mr. W. R. Gardner, Secretary and Treasurer; Mr. George H. Grace, General Superintendent.

The following gentlemen were elected Executive Committee: Messrs. Francis Morris, H. Hentz, C. W. Blossom and Henry Morgan.

The President is ex officio a member and chairman of the Board of Directors, and of the Executive Committee.

The lines of the company now extend to Selma, Alabama, and will soon be constructed to New Orleans, La.

Annual Meeting of Stockholders of the Atlantic and Pacific Telegraph Company.

THE annual meeting of the stockholders of the Atlantic and Pacific Telegraph Company will be held at the executive offices of the company, 102 Broadway, in this city, January 28th.

Exit the Pacific and Atlantic Telegraph Company.

THE wires of the Pacific and Atlantic Telegraph Company have been turned over to the Western Union Telegraph Company, and the former, as a practical telegraph organization, has ceased to exist.

THE receipts of the Submarine Telegraph Company for the month of November, 1873, amounted to £8,851, against £3,485 for the corresponding month of the previous year.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended December 2, 1873, and bearing that date.

145,064.—TELEGRAPH CUT-OUT. William G. Linn, Bloomfield, Iowa. Application filed April 21, 1873.

Central revolving disk, with a metallic raised rim divided into two equal parts by insulating spaces. Disk revolved in one

direction connects B to B and B' to B', cutting the office out; reversing connects B to B' and B to B'.

The movable disk, with its separated conducting strips, combined with the conducting arms B B' B', substantially as described.

145,123.—TELEGRAPH REGISTER. William H. Sawyer, New York, N. Y., assignor to the American District Telegraph Company, same place. Application filed October 17, 1873.

Employs principle of screw thread unison of printers to arrest clock work of registers, preventing running down and waste of paper when not in use.

1. The combination, with the pen lever of a telegraphic registering or recording apparatus, of a shaft, Y, provided with a screw, S, and stop piece X, a pivoted lever, L, carrying a pin, U, a supporting arm, R, and a retracting spring, O, substantially as and for the purposes herein specified.

2. The combination, with the screw S and pin U, of the pivoted lever L, the latter being made flexible for the whole or a portion of its length, substantially as and for the purposes herein specified.

3. The combination, with the arms R and L, of the adjustable stop V, substantially as and for the purposes herein set forth.

145,143.—NON-FREEZING BATTERY. Edward H. Ashcroft, Boston, Mass. Application filed October 30, 1873.

A number of battery cups are arranged upon shelves in a subterranean casing, containing a lamp and having ventilating pipes.

The out door battery, composed of cells C, enclosed in a subterranean close chamber, and provided with lamp D, pipe E for supplying fresh air, and vent F, for escape of the battery fumes and products of combustion.

Born.

LARKIN.—At Kobé, Japan, the wife of Mr. THOS. J. LARKIN, Superintendent of the Imperial Telegraph Department, of a daughter.

SPARKS.—At Abington, Pa., Nov. 30, 1873, to Mr. GEORGE L. SPARKS, Agent of the North Pennsylvania and Northeast Pennsylvania Railroads, a male son.

Married.

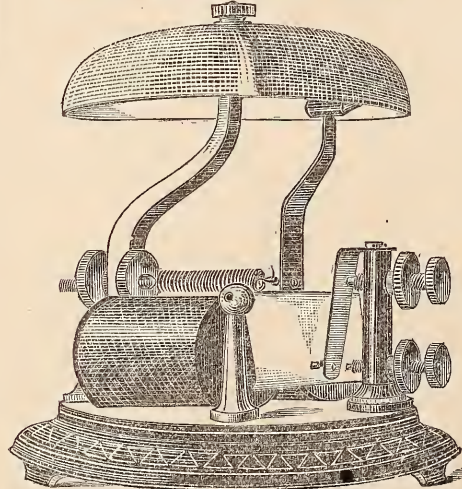
FINKS—BROWN.—At Waco, Texas, Dec. 17th, 1873, Mr. J. H. FINKS, Manager of the Western Union Telegraph, to Miss FANNIE BROWN, of that place.

Died.

UPSON.—At his residence in Burlington, Vt., at 3 o'clock on the morning of December 22d, 1873, of consumption, HENRY S. UPSON, aged 31 years.

Mr. Upson had been in the telegraphic service for about fifteen years, being employed most of the time at 145 Broadway, New York, and Burlington, Vt. He leaves a wife and one child.

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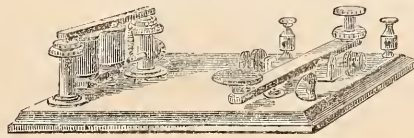
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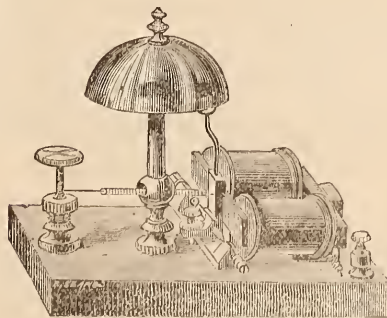
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PURE CHEMICALS AT LOWEST PRICES.

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ALL STANDARD WORKS on ELECTRICITY & TELEGRAPHY.

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8 DEY STREET, NEW YORK.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
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Jersey City, N. J.,
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Lowell, Mass.,
Lawrence, Mass.,
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Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
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New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
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Providence, R. I.,
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Rochester, N. Y.,
Richmond, Va.,
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Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THESE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,
104 Centre Street,
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TELEGRAPH ENGINEER,

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INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

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BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE,

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SULLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**, with Patent Platina Connection, introduced by us eight years since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single **DANIELL** cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made.

Our **CATALOGUE**, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
 DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.
 Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
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constructed in the best and most substantial manner, and on reasonable terms.
 Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer.
 For further particulars, terms, &c., apply to

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S. J. BURRELL, Superintendent,
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A AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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American Compound Telegraph Wire Co.,
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 FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY

HOWARD WATCH AND CLOCK CO.

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This Instrument is offered to the public as the oldest, most rapid, and best.

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in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

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which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS

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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
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 EVERY DESCRIPTION,
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NEW AND SUPERIOR PATTERNS OF

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These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

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KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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For Amateurs and Learners, and Short Lines.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH

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Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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OF EVERY DESCRIPTION.

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Specialties made of

HICKS' REPEATERS, HICKS' RELAYS,

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Cheap Instruments for Learners, Amateurs, &c.,

NEW GRAVITY BATTERY,

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Dial and Printing Instruments for Private Telegraph Lines,

CALL BELLS AND ALARM BELLS of every style.

Batteries, Chemicals, Wire, Insulators,

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MODELS and LIGHT MACHINERY made to order.

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Hicks' Repeaters (1873.)	\$100.00
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Burglar Alarms	50.00 " 200.00

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DR. L. BRADLEY,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

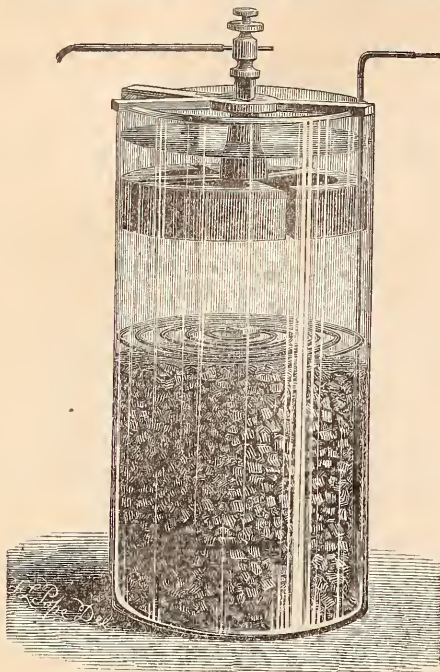
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS

for telegraphic purposes, or closed circuits of any description. This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY

AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is ABSOLUTELY UNIFORM at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

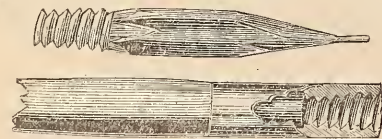
NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.

W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

GEO. H. BLISS & CO., Gen'l Agents,

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MANUFACTURERS OF

ELECTRICAL AND TELEGRAPH INSTRUMENTS

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Material of Every Description,

RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.

Nickel Plated Goods a Specialty.

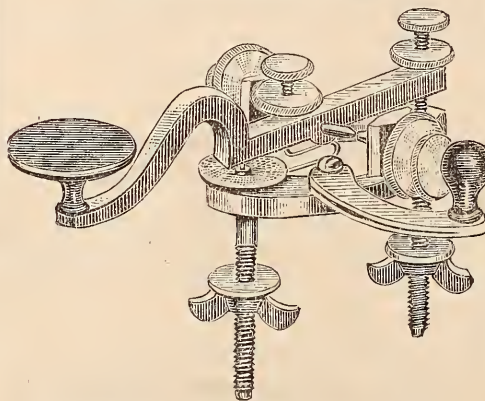
A VERY SUPERIOR MAIN LINE SOUNDER,

ENTIRELY NEW.

SOLE MANUFACTURERS OF THE

PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



Price, \$5.50 plain; \$7 nickel plated.

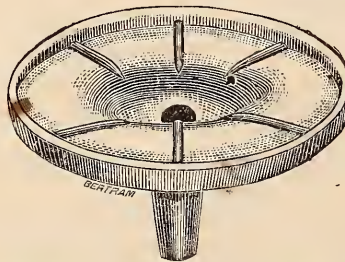
The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK, }
Sept. 22d, 1873. }

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,

A. S. BROWN, Manager.



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it: "We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year."

"We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

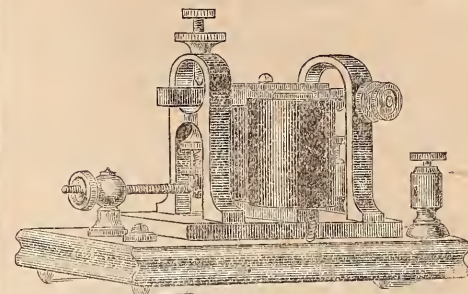
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Designs for Switch Boards for special service furnished.

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PARTRICK, BUNNELL & CO.'S

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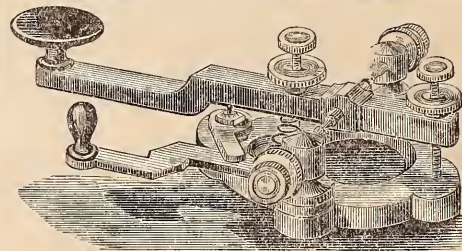


They are offered as being unequalled, and giving louder and better sound, with

ONE CELL OF DANIELLS OR CALLAUD BATTERY, than is usually produced from other Sounders worked by two cells of the same batteries.

Price, - - - - - \$7.50.

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OUR NEW STYLE

IMPROVED CURVED KEYS.

THEY DO NOT STICK,

and it is the verdict of all operators who are using them that they CAN SEND BETTER, FASTER and LONGER with them, without fatigue, than with any others they have ever used.

PRICE, - - - - - \$5.50.

Same quality and style, with Straight Levers, - - \$5.50.

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A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,

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THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection

MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS,

AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

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BRACKETS AND CROSS-ARMS,

FOR SALE BY

L. G. TILLOTSON & CO.,

8 DEY ST., NEW YORK.

The Telegrapher

A Journal of Electrical Progress

Vol. X.

New York, Saturday, January 10, 1874.

Whole No. 391

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OF ALL KINDS,
GALVANIC BATTERIES,
JONES' PATENT LOCK SWITCH,
PATENT ELECTRIC GONGS,
PRINTING TELEGRAPH INSTRUMENTS.
ALSO, ON HAND AND FOR SALE,
D. W. PUTT & CO.'S Mechanical Telegraph
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"Pope's Modern Practice of the Electric Telegraph,"
AND A FULL ASSORTMENT OF
TELEGRAPH MATERIALS AND SUPPLIES.
AT THE LOWEST PRICES.

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All kinds of Electrical Instruments
AND
TELEGRAPH SUPPLIES.
All orders promptly filled, at reasonable prices.
Office and Factory,
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NOVELTY!

A **SOUNDER** of Entirely New Construction,
which gives with the usual amount of battery a very heavy and
clear sound.
SIZE FOR REGULAR OFFICES..... \$5 00
SMALL SIZE..... 3 50
LEARNERS' OUTFITS, with small size Sounder, Key,
Battery, Chemicals, Wire, Instruction Book, &c.,
all complete..... 7 50
Send for Circular.

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109 Court Street, Boston,
has for sale the various kinds of Office and Magnet Wires, in-
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DAY'S KERITE COVERED WIRE.

COVERED WIRES,
Made from Lake Superior Copper, warranted strictly
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Also, PLAIN, WOVEN, ENAMELLED, SHELLACED,
PARAFFINED, and all kinds of
TELEGRAPH OFFICE WIRES.
Also, Telegraph Switch Cords,
many Patterns, Plain, Woven and Braided. Parties being partial
to any particular kind need only enclose a small specimen in a
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535 & 537 CHINA STREET,
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INSULATED WIRES.

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PATENT APPLIED FOR.
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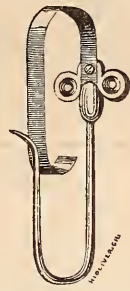
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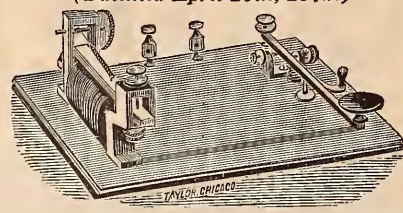
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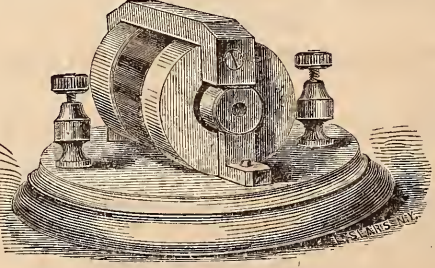
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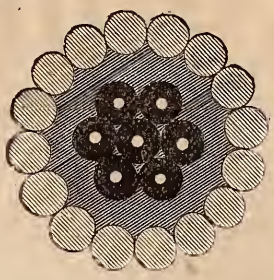
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JANUARY 10, 1874.

VOL. X. WHOLE No. 391.

Original Articles.

A Great Telegraphic Suit in Prospect.

THE litigation which has recently been commenced between the Gold and Stock and Western Union Telegraph Companies on one hand, and the Manhattan Quotation Company on the other, from the nature and amount of the interests involved, seems likely to create as great an excitement in telegraphic circles, before it is finished, as did any of the celebrated suits between the Morse, House and Bain interests, which most of our older readers doubtless well remember. As appearances indicate that active hostilities are about to be commenced, it will probably interest our readers to know something of the origin and causes of the dispute.

The Gold and Stock Telegraph Company first commenced, in 1867, the then novel undertaking of furnishing printed telegraphic quotations of the transactions of the gold and stock markets to subscribers in the neighborhood of Wall and Broad streets, having purchased for this purpose the patents of E. A. Calahan. The Calahan printing instrument employed three line wires, and was capable of transmitting at the rate of perhaps six or eight words per minute; but, in spite of this apparently slow rate of speed, it served an excellent purpose, and the system very soon became an established institution. Within two years a large number of instruments were put in operation, and the profits of the company speedily became very large in proportion to the capital invested. During the year 1869 Mr. S. S. Laws, who was in reality the originator of the system of simultaneous reporting by telegraphic apparatus, also appeared in the field with a printing instrument of his own invention, and established a rival system. The Laws instrument required three line wires, and was not, in any essential particular, an especial improvement upon the Calahan instrument. Upon investigation the patents of the rival concerns were found to conflict, and there was at one time a prospect of a contest between them, which, however, terminated in the purchase by the Gold and Stock Company of Laws' patents and his entire system of reporting telegraphs, including his system of gold indicators, which has proved a notable success. This arrangement was consummated in the fall of 1869, and greatly strengthened the position of the Gold and Stock Company. The next attempt at competition in this business was made by Pope & Edison, who established a system of printing instruments for reporting gold quotations during the winter of 1869-70. Their instrument required but one wire, and was made simpler than any of its predecessors. The enterprise was quite successful, but was eventually purchased in the spring of 1870 by the Gold and Stock Company, together with a number of valuable patents. Meantime the progress of the Gold and Stock Company had been jealously watched by the officers of the Western Union, who were greatly chagrined at the spectacle of such a powerful organization growing up under their very noses, and reaping a golden harvest in a field which they had possessed neither the foresight to discover nor the administrative skill to cultivate; so they at length determined to enter the arena themselves with a new system, intending to employ an elegant and rapid printer, which had been invented by Mr. G. M. Phelps, superintendent of the company's manufactory, and which required but two line wires, although it was capable of doing three or four times as much work as any of the previous instruments in use.

By the latter part of the year 1871 Mr. Phelps had perfected his invention, and had built a large number of the machines, and it seemed probable that there would be a vigorous campaign opened against the Gold and Stock Company. Almost the sole advantage of the Western Union, as far as the business of New York city was concerned, consisted in the superior working qualities of their instrument. The Gold and Stock, on the other hand, already occupied the field, which advantage, together with their energetic management, and more especially their experienced, skilful and well trained employes, weighed heavily in their favor. Besides this they were owners of patents, on the basis of which instruments even more rapid and effective than that of the Western Union might have easily been constructed; but the threatened contest terminated in a compromise and the union of the two adverse interests. The Gold and Stock Company maintained its separate

organization, but a controlling interest in the stock passed into the hands of the Western Union Company. Scarcely had this arrangement been effected when still another competitor appeared upon the scene, in the shape of the Manhattan Quotation Company, which was destined to become the most formidable and successful antagonist of the whole series. The instrument employed by them was devised by J. E. Smith, and required but one line wire, while its effective speed was considerably greater than that of the old instruments—a consideration which the growth of business in the exchange had rendered a very important one. The new concern pushed matters very energetically, and within a year of the time they first opened for business they had put in a large number of instruments.

The old organization, naturally, were not disposed to share their large and lucrative business with a rival without a vigorous contest. Accordingly, several months ago the Gold and Stock Company commenced legal proceedings in the United States District Court against the Manhattan Company, alleging an infringement of a number of patents of which they were sole owners. Three distinct suits were instituted—one against the Manhattan Quotation Company, another against certain of its chief officers, engaged in promoting the enterprise, and a third against Mr. C. T. Chester, the manufacturer of the instruments employed. In addition to these, other suits have been commenced against the same parties by the Western Union Company for an alleged infringement of the notorious Page patent, and which are no doubt intended to test the validity of this somewhat questionable monopoly. Furthermore, notice was issued to all the subscribers of the Manhattan Quotation Company that they would be held liable for damages for using the instruments of that company. The Manhattan Quotation Company thereupon promptly issued a circular to their patrons, containing opinions signed by two eminent patent lawyers of this city, to the effect that the instruments used by the Manhattan Quotation Company did not "infringe any patent or patent rights under patents issued to any parties other than those owned by the said company." On the 30th of December the Gold and Stock Company came out with another *pronunciamento*, announcing a reduction of terms from six dollars per week to ten dollars per month, to take effect on the first of January. But perhaps the most important feature of this circular was a copy of certain correspondence between the attorneys of the Western Union Company and the two eminent attorneys whose opinions appeared in the previous circular of the Manhattan Company, and was quoted in substance above. One of them says, in his reply: "I have recently examined several of the telegraph printing machines put up and in use by the Manhattan Quotation Telegraph Company in this city, and find that they embrace devices that were not in the machine previously examined by me, and upon which my opinion referred to was based." In conclusion, he pronounces the machine actually in use "An infringement of the 11th, 12th and 13th claims of Page's reissued patent."

In reply to this, the Manhattan Quotation Company came out with another circular on the 2d inst., addressed to the bankers and brokers of the city, setting forth that the Gold and Stock Company—especially since their alliance with the Western Union—had become "arrogant and unreasonable in their treatment of customers, slow and careless in furnishing quotations and financial news, and impatient of just complaints," and claiming that they (the Manhattan Company) had furnished a vastly superior instrument; had abolished the former charge of \$100 for the introduction of instruments; had reduced the charge for all kinds of service to the sum of \$6 per week, and, finally, had contributed to the payment to the Stock Exchange of a rental of from \$20,000 to \$30,000.

In regard to the heavy reduction of rates by the Gold and Stock Company, above referred to, the circular contains the following: "And now, practically admitting that a fair competition on the merits of the instruments is too much for them, and that they have no hope of succeeding in their suits for a pretended infringement of their patents, this powerful monopoly has lately announced, by their circular of the 30th of December ult., that they will reduce the price of their stock instrument to \$10 a month—thus resorting to the policy of crushing out this company by reducing the charges for similar service below a living rate." The circular also denies that any deception has been resorted to, as charged by the Gold and Stock Company.

The fight is likely to prove a lengthy and obstinately contested one, especially so far as the question of the validity of the Page patent is involved therein—and, judging from universal experience, it seems probable that the contest will end in a consolidation of the opposing interests in some shape, whatever may be the final result of the litigation. Meanwhile, the prospect is that the host of eminent counsel who have been engaged will reap a rich harvest. Nothing like so cheering a prospect, telegraphically, for these gentlemen has turned up since the days when "Fog" Smith,

Henry O'Reilly and Amos Kendall, "fought, bled, and paid" on many a well contested field.

A Reply to Mr. William Orton, in regard to Automatic Telegraphy.

AUTOMATIC TELEGRAPH COMPANY,
80 Broadway, Room 28,
New York, Jan. 3d, 1874.

WM. ORTON, ESQ.,
President Western Union Telegraph Co.

SIR: Referring to your letter, published in the New York Tribune of December 27, 1872, criticising the Annual Report of the Postmaster General, so far as he discusses the possibility of cheaper telegraphy, you are pleased to task him, by implication, with using his office to further private interests, because he is awake to current developments, and states a few facts which will not be gainsaid by any one capable of seeing and judging, and cannot be refuted by mere assertion.

We had no idea that Mr. Cresswell would make any reference to the Automatic system in his report, much less mention it with even qualified approval. If Automatic telegraphy be the utterly worthless thing you would have your stockholders and the public believe it, why indulge in such a labored attack upon it? It has been in operation, between New York and Washington, during the past year, for general business, which would seem to be the best evidence of its practical working. To ignore facts, simply because they are unpleasant, is not the part of wisdom.

In 1869, after the "Duplex" had been in practical operation between New York and Boston for several years, you said, concerning it, "The double transmitter—an apparatus for working both ways over one wire at the same time—has long occupied a prominent place among speculative telegraphers, and has recently been extensively advertised by the promoters of the various competing lines. During the past 20 years there has been several inventions for accomplishing this result, the first being that of Dr. Gintl, of Germany; but, while it is possible, under certain exceptional circumstances, to transmit messages both ways at the same time over one wire, the conditions under which this result is obtained are such as to render the general use of the system impossible. If there were, however, any practical value in this apparatus, its use, like that of the Morse telegraph, is freely open to all."

In 1873, after circumstances allowed you to secure it at a nominal sum, you characterize it as "the most important and valuable of all the improvements which have been made since the Morse telegraph was first established," and excite the imagination of your stockholders, over prospective dividends and the obliteration of further competition, in the following eulogistic passage—

"The Duplex apparatus, the patents for which are owned by the Western Union Company, is capable of rendering more valuable service than the Automatic, even if the graver defects of the latter are successfully overcome. The Duplex works equally well single or double, thus obviating the necessity for duplicating instruments. It doubles the capacity of a wire by enabling messages to be transmitted over it in opposite directions at the same time, without any perceptible diminution of speed. It does more than save the cost of providing and keeping in repair additional wires. It gives the carrying capacity of two wires, when, by accidental interruptions, there is but one in working order, and when no amount of money previously invested in wires would have provided another."

Meantime the world moves—Automatic telegraphy is developed, and you would again treat it with the same contempt as you formerly regarded the now much vaunted Duplex.

It is unnecessary to comment on your assertions that the Automatic system has been for years seeking a market. Enough to say that no one has ever yet been authorized to offer it for sale, and its present owners are still content with their investment: nor is it necessary to reply in detail to the extravagant statements made as to the cost and character of machinery and equipment, the large number of operators needed, and the comparative capacity of the various systems.

The fact exists, notwithstanding, that we perforated the President's late message at the rate of 25 words per minute per man, transmitted it in 34 minutes over one wire from Washington to Pottsville, Penn., and there copied it at the rate of 32 words per minute per copyist—the perforating, transmission and copying, of course, proceeding simultaneously, as in the case of the Western Union.

We shall have the pleasure of doing that or better in a further demonstration within a few days, and shall be pleased not only to have you present, but also to present you with affidavits of responsible gentlemen, which will be eminently more convincing and satisfactory to the public patrons of the telegraph than any mere statements.

You will recall a conversation with the writer last winter, in Washington, when, in the discussion of this

subject, you raised numerous theoretical objections, to which he replied that it did not rest on his statement, as that might prove nothing; nor would your simple refutation change the matter. The question the writer put was: "Is the work done?" Our daily experience then and since is the answer.

Regarding your positive statement that press matter cannot be hauled automatically in the day time, we simply reply that all offered us is being transmitted between Washington and New York for a half cent per word—which is at least 50 per cent. less than the present charge of the Western Union Company—and this is done in conjunction with our ordinary commercial business.

Be patient and you shall hear from us again. The President of the Western Union Telegraph Co. should know what is going on in the telegraphic world. If he does not, we will endeavor practically and kindly to inform him.

J. C. REIFF.

Action of the Cleveland, Ohio, Western Union Operators on the Death of Mr.

George D. Phillip.

MR. GEORGE D. PHILLIP, who had been employed as an operator in the Cleveland, Ohio, Western Union office for several years, died recently of small pox, after a brief illness.

The following letter and resolutions, expressing the sentiments of his late associates, were prepared and forwarded to his family, and are published by request in THE TELEGRAPHER:

"To the family of the late George D. Phillip.

"DEAR FRIENDS: Enclosed you will find resolutions deploring the untimely death of our late beloved friend and associate, George D. Phillip. They contain our heartfelt sentiments. His departure upon the great unknown sea comes home to us like a personal bereavement, and impressively teaches us that "he who builds beneath the skies builds too low." He was one of the fortunate few who possess the happy faculty of conciliating and pleasing every one, and his accommodating and winsome ways have left an indelible impression upon us, and we sympathize very deeply with you in your irreparable loss.

"Please accept these resolutions as a sincere expression of friendship for our departed friend, and cherish them for memory's sake.

"At a meeting of the telegraph operators of Cleveland, Ohio, held Sunday, December 23, 1873, at the Western Union telegraph office, for the purpose of taking fitting action in regard to the death of their late fellow operator, George D. Phillip, the following resolutions were adopted:

"Whereas, We deem it proper to tender to those he held so dear our sympathy, and to express our regrets at the loss of our esteemed friend and associate, George D. Phillip—

"Resolved, That by his death the profession has lost one of its most accomplished members, the telegraph company a valuable servant, and his fellow operators a kind companion and a true friend.

"Resolved, That we tender to the family of the deceased our heartfelt sympathies in their great bereavement.

"Resolved, That a copy of these resolutions be presented to the family of the deceased, and that they be published in the papers of this city and in the journals of the country devoted to the interests of telegraphy.

V. D. GREENE,
J. T. HANFORD, } Committee.
R. W. WILLIAMS,

"O. A. GURLEY, Secretary."

The Society of Telegraph Engineers.

THE annual general meeting of the London Society of Telegraph Engineers took place on the 10th of December last. The annual report was read by the chairman, Mr. W. H. Preece, and showed that the affairs of the society were in a very prosperous condition. The total number of members, including honorary, associate and foreign members, at the date of the report, was 512. The society has lost several of its most prominent members by death during the past year, among whom may be mentioned Sir Francis Ronalds, the very father of telegraphy; Mr. Lendi, of Berne, and Mr. George Seward, of Atlantic cable celebrity. The balance of funds on hand at the close of the fiscal year was over £500. Three honorary members have been added to the rolls of the society during the year, viz., Professor G. B. Airy, the Astronomer Royal; General Edward Sabine, and Professor William Weber, of Gottingen. A number of changes and modifications have been made in the rules and regulations of the society. Any foreign member can now become a life member upon the payment of ten pounds. The following officers were elected for the ensuing year: President—Sir William Thompson. Vice Presidents—Lord Lindsay, Latimer Clark, R. S. Cully and Professor G. C. Foster. Other members of Council—Professor

Abel, Major Malcolm, W. H. Preece, Robert Sabine, Carl Siemens, Lieutenant Colonel Stothard, Major Webber, Wildman Whitehouse, C. F. Varley, C. E. Spagnoletti, C. V. Walker, Professor Williamson. Associates—A. Bell, Dr. A. Muirhead, Lieutenant Watson. Auditors—J. Wagstaff Blundell, Fred. C. Danvers. Treasurer—Major Webber, 101 Cannon street, E. C. Hon. Secretary—Major Frank Bolton. Secretary—George E. Preece. The society have recently secured commodious and convenient rooms for a library, office and meeting room at No. 4 Broad Sanctuary, which are being prepared for occupancy, and will be opened early this year.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Automatic and Morse Telegraphy.—Reply to the Official "Journal."

NEW YORK, Jan. 6th.

TO THE EDITOR OF THE TELEGRAPHER.

SIR: As the Western Union Company furnish the money to pay for printing and editing their official *Journal*, it is, of course, natural that the company should wish to exclude from its columns matter detrimental to its own interests; but, as the *Journal* affects to be "up" in all the scientific and practical departments of telegraphy, it could not well avoid alluding to automatic telegraphy, and here is the way the editor does it:

"Now, we claim that if it takes as long to prepare a message for transmission by one process (Automatic) as to transmit it by another (Morse), the latter process, in all but exceptional circumstances, must have the advantage."

In the first place, it is well known to every person who knows anything about Automatic telegraphy (and to none better than to the editor of the *Journal* and his employers), that the average speed of Morse operators, in large and small offices, does not exceed 6,000 words per day of ten hours. The leading officers of the Western Union Company, including the editor of the *Journal*, know, from their own eyesight, that the perforators of the Automatic Company have been accurately worked up to 135 words per minute, and to such expert operators 3,000 words per hour would be a very easy task; and, to the slowest operators of the perforators, 1,500 words per hour would be as easy as 500 words per hour to the average Morse operator.

In the very outset, therefore, of the *Journal's* allusion to automatic telegraphy, the editor deliberately robs the system of more than TWO THIRDS of what actually belongs to it, and then complacently assumes that its absurdly untrue premises are correct, and, of course, finds it easy to deduce conclusions satisfactory to the managers of the Western Union Company.

But it is easy to show the absurdity of the *Journal's* conclusions, even if we concede to it all it claims; and, for illustration, let us take two lines, of one wire each, say 100 miles in length, with twenty offices on each—one Morse and one Automatic.

The twenty Morse offices take in an average of thirty words each per hour, which, with the addresses and signatures, would aggregate over 1,000 words per hour, which, of course, any disinterested Morse telegrapher would unhesitatingly say was twice as many words as are ordinarily transmitted over way or side lines. Now, then, obviously, eighteen of the twenty Morse operators must be standing still—utterly unable to advance the work of the line in any degree—as only two can work the line at the same time.

At the end of ten hours, the wire having been constantly occupied, it has conveyed 10,000 words, and eighteen of the twenty operators have been waiting their turn at the wire, which they have individually obtained once in every hour—so their messages have been delayed only an average of sixty minutes.

Now, turn to the Automatic line of twenty offices, each averaging a business of 500 words per hour. As fast as the messages are handed in, each of the twenty operators finds steady employment in perforating or copying the messages or in transmitting them—no one office holding possession of the wire over one minute. In each hour, therefore, the Automatic wire will have been in actual use but twenty minutes, but yet the twenty operators have been able to so employ their time that they have served the public with 10,000 words as easily as the twenty Morse operators have served them with 1,000, and the day's business foots up 10,000 words for twenty Morse operators and 100,000 for twenty Automatic operators.

Here are legitimate advantages of nine to one in favor of Automatic telegraphy, and it is not in the power of the editor of the *Journal*, nor of any of his

employers, to imagine a probable combination of circumstances wherein Automatic telegraphy will not show actual advantages over the Morse system, varying from at least fifty to ninety per cent.—always, of course, on the supposition that the public will transact a very large business over the wires, if they can do so at a very small charge. D. H. C.

More Reminiscences.

TO THE EDITOR OF THE TELEGRAPHER.

THE contributions from the veterans appear to be well received, and, even if they do tell tales out of school occasionally, there is little harm done. Charley Jones rather goes for a fellow about my size, but I forgive him.

But what I wanted to put on record is the story of one of the early day mysteries, which never was explained before, and which will not meet the eye of the injured party in all human probability. During the "early days" opposition lines were extended rapidly Westward, and the town on any great thoroughfare was small indeed that could not boast of two offices. In a little place that shall be nameless, the spirit of competition was made a personal matter between the operators, and all sorts of devices were concocted to curry favor with customers, and decry the ability and injure the facilities of the opposition. Little jokes were played, and matters were worked up to a fever heat. One line opened late in the fall with a brand new office and instruments, a glittering sign, and other appurtenances of an equally attractive nature, and business flocked to the standard of the Speed man. The O'Rielly man became thoughtful and almost despondent. Saturday night all was lovely with the Speeds, but Monday morning the Speed man was in trouble. His circuit came and went like the "milk sick" in Indiana, and all his communications were fractional; but there was no trouble elsewhere on the line. His office was in a loop, so he hunted for it there. He climbed every pole in the town—a mile of poles—without climbers, but found nothing, and still the current came and went irregularly, and apparently without cause. Oh! how he turned and twisted the screws of his instruments and fussed with his local! His hooks filled, his customers grumbled, then left him and returned to their first love. Then the repairer came and sweat, and quoted from the book of common prayer, and went home again. Things went on in this way several days, until one morning the trouble disappeared as mysteriously as it came and was heard of no more. By some means or other two fine wires had made connections between two separated sheets of zinc under his stove, which stood on bricks, and the wires on either side of his instrument, and as they lay in the grooves of the floor they had been overlooked, and somehow or other the tongs, every now and then, and occasionally a wet boot, completed the cut-out. The uncertain action of the unfortunate arrangement was what made it difficult to find, and it was accounted for, in a sort of Dundreary style, "As one of those things no feller can find out."

Between Queenston and Lockport the line ran through an Indian village. When lines would not work in those days you would find on the office door a notice something like this:

"Gone out on line. Be back soon as I find the break."—OPERATOR.

One terribly cold day in January my office was decorated as above, and I was footing it between the two points named. I met a noble red man and made inquiry as to the *status* of the line, and the noble red caromed on the white as follows:

"Me show where broke. All right now. Me fix 'em. Indian wan't pail handle; rope no good for pail."

The breechless Modoc supposed a fair exchange was no robbery, and so he had traded, giving string for wire, and had put up an extra pole, in the shape of a slanting fence rail, into the bargain, to keep the line from the ground. I thought, "pretty well for Ingin." Come again, somebody. C. C. H.

The Western Union Company vs. The Poor Inventor.

TO THE EDITOR OF THE TELEGRAPHER.

A CORRESPONDENT in your last number has something to say on the subject of the treatment of inventors by the Western Union Company. If he had stopped to think a little it might have occurred to him that there is another aspect of the subject. Take for instance the case of the Milliken repeater. There was certainly nothing to prevent Mr. Milliken from taking out a patent (provided the invention was really his, which I assume to be the fact) any time within two years of the date when his invention was perfected and put in practical operation. Failing to do this the invention became public property, in accordance with the Act of Congress. As Mr. Milliken held a position as manager of one of the largest telegraph offices in the country, it is hardly reasonable to suppose that he failed to apply for a patent on account of lack of funds, as the expense of

so doing certainly would not have exceeded \$100. Having made no effort whatever to secure his invention, and having allowed it to become public property, I think it is hardly worth while to raise a howl because the Western Union Company have seen fit to equip their lines with it, as they had a most undoubted right to do. In fact, it is very likely that this was done with the permission of the inventor, as he has made no protest against it, "so far as heard from."

I know nothing about the case of Culgan, but as the switch never was patented (or patentable either, for that matter, in my opinion), it is fair to presume that it was substantially a similar one to that of Milliken.

In regard to the Duplex patent, if it is true—as your correspondent asserts—that "almost every point about the latter invention of any practical value, and which was not free to public use, was anticipated in Farmer's patent of 1858"—I would like to ask where Farmer has been all this time? If his invention was a practical one, why was it never used? I think, when the matter is sifted, that we shall find that, as is often the case, his invention fell just short of success, and that Stearns added some apparently trifling but really essential modification, that just bridged the narrow gap between success and failure. Most great inventions are made in just that way, and the man who puts on the finishing touch gets credit for the whole. It seems unjust to his predecessors, who have borne the burden and the heat of the day; but is it? The question is: Are we not indebted to the man who gives the invention to the public in an available form, for the benefits we actually derive from it, and for which we pay our money? It is obviously impracticable to divide up the credit and the compensation in due proportion among the thousand and one inventors, each of whom contributed more or less towards the development of almost every great invention that could be named.

Furthermore, I would ask if it seems likely that the Western Union Company, having in their employ some of the ablest patent counsel to be found in the country, would be so supremely foolish as to pay out such a large sum of money for a patent of this kind, if, as your correspondent says, it was anticipated by Farmer's patent, which, of course, was readily accessible to any one who chose to look for it? The very idea is a manifest absurdity. Lastly, by what authority does your correspondent assert that the Page patent is fraudulent? Congress authorized the Commissioner to grant Page a patent for whatever he might be able to prove himself the original inventor of. His claims were examined in the Patent Office, and passed upon precisely the same as those of any other inventor, and are, therefore, presumably valid. If the Western Union Company thought enough of the patent to do so, I cannot see wherein they did wrong to buy it. The company was probably established for the purpose of making money. If the patent is worthless there should be no particular difficulty in proving it; if, on the other hand, it is good, the company would finally have been obliged to buy it in any event, for their own protection, and if they were convinced of its validity, they were very wise in getting hold of it in good season. I have heard a great deal said about the Page patent being used as an "engine of oppression," but from the fact that nobody has been molested by any attempted enforcement of it, although the Western Union Company have owned it for more than two years, it would seem that they bought it principally for self-protection. Some of your correspondents are always ready to raise a hue and cry at the Western Union Company, but I fancy the officers of it generally do just about the same as any one else would place in their position. INVENTOR.

A Response to Nettie Bronson.—"Plugs," not Female Operators, Objectionable.

FALLS CITY, NEB., Dec. 31.

TO THE EDITOR OF THE TELEGRAPHER.

NETTIE BRONSON takes me severely to task for my strictures on the superfluous number of "plugs" throughout the country, and, as she does injustice to the motives which prompted that article, "I rise to explain."

Without the remotest idea of assailing your sex, Nettie, that protest was made purely against the too early employment of students, before they could lay any claim to being capable of managing an instrument. In self-vindication, and to further explain the injustice of your observations and conjectures, I will add that I have instructed ladies to become expert operators, but they did not take charge of an office until their competency was quite manifest.

About that "dollar bet"—you cause a manly blush to overspread my physiognomy.—I suspect you would lose. I am pronounced the quittance of modesty. I made so many "bulls" while learning the art, half a decade of years ago, that it took all the conceit out of me. You did not give the geographical location of those "soft" operators, but we don't have any of that class out here.

The encouragement of ladies to become operators is very generally and highly commended, and by few

more so than this scribe. They are admirably adapted to this peculiar employment, and the deference shown a poor operator on the lines is the strongest evidence of sympathy and consideration for her that can be produced, and a like inefficiency in a man would hardly be tolerated.

The avenues for ladies to find suitable, and the chances of remunerative employment, are too few, and no obstacle would be willingly thrown in the way to their preferment in the telegraph ranks. The most common and formidable objection raised is the likelihood of their abandoning the calling in a few years, from various causes, and therefore start in the business with such a contingency in view.

A person starting out to learn operating should be made acquainted with the qualifications requisite to become successful. Many illiterate persons attend these institutes month after month, and actually demand recognition in the profession for their trouble, without any other evidence of merit or sympathy than an exhausted purse and wasted time.

But, Nettie, you make a sweeping accusation against us operators for what would seem our lack of magnanimity. You probably never realized what a vast amount of patience it requires to transact business over the wires with a "plug," especially when one has little time to squander coaxing messages to such.

It is an over-zealousness in students to become managers or operators, before they have attained reasonable proficiency, that robs them of their real merits. Personal experience indicates to my mind the importance of these considerations. I had, while learning, the usual zeal to take an office, and was, at the same time, very doubtful about being able to hold a place when I got it, and have since thanked the operator by whom I was instructed for restraints on such impetuosity.

The opportunities for learning the first rudiments of the art are innumerable, and this kind of employment to young persons is fascinating, hence a great number of persons attempt to learn, encouraged by a mistaken belief that no personal adaptation is essential.

It is with no "dog in the manger" spirit that the generality of managers repel the students, by any means. There are few operators that outgrow their remembrance of having belonged to that class themselves, but the constant demands on managers to "finish learning," or, to practice, or, by more courageous ones, for a job, brings the class into bad odor with managers.

This will account for the ill success of so many students who venture among strangers, and expect sympathy and assistance. AARON AROUND.

Telegraphers' Unions Impracticable and Why.—The Moral, Social and Professional Status of Telegraphers.—Reduction of Salaries, and Official Christmas and New Year's Greetings.

TO THE EDITOR OF THE TELEGRAPHER.

If I remember rightly, I have expressed myself on the subject of Telegraphers' Unions before, but I might add a reason or two more why I believe them to be impracticable:

First. There are two distinct and separate classes of telegraph operators, which are removed as far from each other as though they were of different vocations. I refer to the railroad operators and those employed upon commercial lines. There is no harmony of feeling and action, no sentiment of sympathy existing between them. The generality of railroad operators have been reared, so to speak, on railroad lines, and know nothing of the workings of commercial lines; and railroad wires and the mysteries of train orders, etc., are as foreign to the commercial operator as water to the fowls of the air.

Second. The great difference in the capacity of operators and its consequent result—the wide range of salaries—is a serious obstacle.

Third. There is, as I have said before, no one to act. It is all well enough to write anonymous communications for THE TELEGRAPHER, or assume some *nom de plume* and express one's self, but I really have very serious doubts whether there is actually a man in the fraternity who is bold enough to assert himself sufficiently to accomplish anything.

Regarding our standing socially and morally, of which some few of your correspondents have spoken, I have noticed a *something* wrong myself—but it does not seem to me that it is because we are so very immoral. Indeed, the telegraphers of my acquaintance are, with a few exceptions, inoffensive, good-for-nothing fellows, who would do no one a wrong. I am one of the same class—am not smart enough to do a mean or dishonest thing—and yet I have observed that in social circles the telegrapher is not respected as I think he ought to be. He is considered an insignificant sort of fellow, instead of the representative of the greatest of art sciences.

For this I am unable to account. I have sometimes

wondered if it were not on account of the imperfect knowledge of the art and our inferior qualifications. But I hardly think this is so much the trouble as is the fact that we stand divided against ourselves. There is not enough of harmony between us and unity of action. If we wish to gain the esteem of others we must first learn to esteem ourselves.

Although, taken as a class, I do not believe we are so very immoral; yet, the term "press operator" is always associated in my mind with unlimited and untold quantities of whiskey. My first inward exclamation, on reading the article of your correspondent the other day, who told us of the great feats he had performed, was: "Ah! how the 'benzine' must have suffered." A man who is really a *first class* operator, and can show himself to be such, ought not to apply for work in this section of the country; it is hardly worth his while. They are said to be *unreliable*.

As your correspondent, Nettie Bronson, says, "the telegrapher is surely a very conceited mortal." One glance at your correspondents' columns justifies this belief; and I claim no exception to the general rule. There is scarcely a day but I see how much more I admire and appreciate myself than others do. How unwilling would a single one of your correspondents be to acknowledge the limited number of years of experience they have had at telegraphing; and in the four years I have worked at it, I have got this principle so thoroughly inculcated in my mind, that not for worlds would I have one of your readers mistrust that I am a minute less than twenty years at the business!

The salaries on many of the lines in this section have been reduced ten per cent. Our lines are included in the number. And now comes the meanest part of the story. I have read of the man who whipped his oldest boy when his wife found tobacco in his own pocket—whipped him, he said, because the tobacco belonged to the boy, and the boy had put it there to escape detection—I have read of this, and how the depraved old vagabond afterwards laughed, and told his bar-room friends how it made his old heart glad to think he had a boy that could be relied upon in case of emergency; but it strikes me this is not a comparison in meanness to the keeping in of operators, upon legal and national holidays, to send Christmas and New Year's greetings from the officials to "all employes!!" And, methinks, if those who favored the reduction knew how strangely those smoothly worded greetings sounded—how harshly they grated on our ears—if they knew of the little some of us had to make our Christmas merry or the New Year happy, they would refrain from sending them.

But, for the life of me, I cannot begin to imagine what we are going to do about it, even though we do not like it. But we will hope for better times, and hope in dead earnest, too. In the spring, we are told, they will come; and until then we will patiently submit to that which we cannot now remedy. J. H.

A Telegraphic Union the One Thing Needed.

BUFFALO, N. Y., Dec. 29th.

TO THE EDITOR OF THE TELEGRAPHER.

SIR: In your last number I saw an article signed "Rover," and as he agrees with me in his idea of a Telegraphic Union, I wish to give my views on this subject:

In the first place, I contend that there is no trade or occupation in this country (requiring the same amount of education and ability to master it) that receives so low salary as telegraphers in general. Take any of the trades—gas fitters, plumbers, engineers, etc.—are those men superior in either education or ability to telegraphers? Emphatically, no; and yet either of them can command as much or more than a first class telegrapher, and the situation is growing worse each year. Now, let us have a Union, as Rover says, "built on a firm basis." Admit none but first class men; put them through the mill first, and then, with a ticket signed by the officers of the Union, the holder would be respected, and could always be sure of a position, and I am sure that in a short time the Union men would be in demand, and the plugs be where nature intended them, *i. e.*, chopping wood. Speaking of plugs reminds me that the operating department is not the only place to find plugs in. I mean plug linemen or repairers—and from my observations I think the percentage is very large, and no wonder. It is the same story with them as with operators—no standard of ability. Now is the time to form a Union, for delays are dangerous, and unity is strength, and if it is ever wanted now is the time.

As I am not an operator, I will not attempt to describe how the Union should be constructed, but will leave that to older heads than mine. Start the Union, brothers, and I will lend a helping hand. S. G.

Answer to Correspondent.

G. E. C.—Do not know where the articles mentioned can be obtained, or that any one manufactures them now.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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The Postmaster-General and Mr. Orton on Automatic or Fast Telegraphy.

In considering last week the reply of Mr. ORTON to the Postmaster-General's report on the subject of telegraphy, and his attacks on the Western Union Telegraph Company and that gentleman personally, we proposed to make that portion of both the subject of a separate article.

In reference to the Automatic system of telegraphy, the Postmaster-General, in his report, says:

"For years past the attention of inventors and scientists has been attracted to the necessity for a more rapid and less expensive mode of transmission than the Morse, which requires the message to be spelled out by a slow and tedious process, at about the speed of an ordinary writer. One of the results of their investigations is the 'Automatic, or Fast System,' now in operation between New York and Washington. This system is capable of a speed of from 500 to 800 words per minute. The average of an expert MORSE operator is not over 25 words per minute. Therefore, it is evident that if the Automatic method can be made to accomplish what its advocates confidently predict for it, the capacity of a single wire for business will be increased nearly or quite thirty times. This increased capacity may again be doubled, or, perhaps, quadrupled, if the Duplex apparatus, now used every day by established companies for sending messages simultaneously in different directions on the same wire, can be successfully combined with the Automatic machine. There can be no doubt of the ultimate success of the Automatic principle. Its battle with an incredulous public is almost won. As soon as it shall be thoroughly developed and applied in practice, the problem of cheap telegraphy will be definitively solved."

To this Mr. ORTON responds:

"The next notable statement in the report relates to what is therein styled the 'Automatic, or Fast System.' It is certainly an unusual instance of good fortune when the owners of patents, who have been for years unsuccessful in their efforts to make a satisfactory sale, are enabled to secure so valuable an advertising medium as the Annual Report of a Postmaster-General. The inference to be drawn from the statements in the report concerning this wonderful 'system' is that it is a budding novelty, just ready to burst into the full bloom of triumphant success. I would not blast its promise by even the breath of an unkind word, but a few plain and simple truths concerning it must be told:

"First.—It is not a novelty. There lies beside me as I write a pamphlet, bearing date December 1, 1869, throughout whose twenty-two pages the praises of what it had then achieved are glowingly set forth.

"Second.—It is not a success. Four years of constant trial, during which large sums have been expended in practical experiments, and in endeavoring, by new devices, to overcome constantly developed defects, have failed to demonstrate its superiority over existing modes, or even its ability to compete successfully with them.

"Automatic telegraphy, as a separate system, has never been attempted in any country. It has been in use in England for several years, but only as an aid to the Morse system, or as a substitute for others greatly inferior to the Morse, and which were either never introduced into this country or were long since discarded. Its chief defects are—

"1. More time is required to prepare a message for transmission by the Automatic than to send it by the Morse. By the latter the receiving operator writes out the message as fast as the sending operator transmits it, so that when the sending is finished the copying is completed, and the message ready for delivery.

"2. By the Automatic system the message is received in the dots and dashes of the Morse alphabet. More time is then required to translate and copy than is occupied in both sending and copying in the ordinary way. No matter, then, what the rate of speed at which the signals are made to pass over the wire—if it takes as much time to prepare for transmission, and again as much time to translate and copy, after the message is received, as to transmit and copy by the Morse system—it is plain that twice as much is consumed in respect to any single message by the Automatic process as by the ordinary Morse.

"But there are other grave practical difficulties. The Automatic apparatus, as compared with the Morse, is cumbersome, intricate and costly. It gets out of repair easily, and the cost of providing duplicates for use in case of accident, and of shipments over long distances for repairs, constitute a serious objection.

"Again, it is evident that in the separate processes of perforating, transmitting, translating and copying by the Automatic system, more operators are required than in the regular Morse. The testimony of those connected with the Government telegraph in England is, that it takes five times as many operators to successfully work the former process as the latter.

The cost of operating is the chief expense of carrying on the telegraph business. It would be much cheaper to provide additional wires, and to apply the Duplex to them, than to double the cost of operating; but if it be necessary to multiply this cost by five, that fact alone constitutes a fatal objection."

In an appendix to his letter Mr. ORTON elaborates his argument, and, by assuming certain conditions, endeavors to prove the inferiority of the Automatic over the Morse system as regards speed and relative cost. The argument and assumptions are certainly ingenious, but an analysis shows both to be fallacious.

It might be supposed that his experience in decyphering the Duplex system and apparatus as utterly impracticable, and subsequently purchasing the same at a large price for the Western Union Company, and vaunting it, as he has done in his last Annual Report to the Stockholders of that company, as the greatest and most valuable telegraphic invention of recent years, would have induced more modesty and caution in his treatment of the Automatic system. If he remains in the telegraph service for any considerable time he will undoubtedly change his tone as entirely, in regard to the Automatic, as he has already done in regard to the Duplex.

As the readers of THE TELEGRAPHER will bear witness, we have never been extravagant (its friends think us hardly just) in our statements in regard to what the Automatic system has accomplished or is capable of. We have given space to nothing in favor of that system which we have not had good reason to believe was fully substantiated by actual performance. We do not now regard it as likely to supersede the Morse, but believe that it has proved of great value and advantage, and will become more so as it is more generally introduced.

Mr. ORTON bases his arguments entirely upon what has been accomplished by the WHEATSTONE Automatic in England. We willingly concede his statements in regard to that system to be correct, so far as they go, but the WHEATSTONE is much slower, relatively to the American (or LITTLE) Automatic, than the Morse, as practiced there, is slower than the same system in this country and with American operators.

The Western Union officials are making progress on the Automatic system, evidently. In the fall of 1870 Mr. GEORGE B. PRESCOTT, the electrician of the Western Union Company then as now, stated, in a communication published in the *Scientific American*, that after an exhaustive series of costly experiments, (instituted on behalf of that company), he had proved the utter impossibility of attaining by any known means a greater speed than fifty to sixty words per minute automatically on 100 miles of line. Mr. ORTON now concedes that nearly 12,000 words can be and have been transmitted in distinct legible signals, in one instance in thirty-four and in another in twenty-two minutes, on about 300 miles of line!

In 1872 Mr. ORTON asserted, before a Congressional Committee at Washington, that the wires and operators of the Western Union Company were capable of telegraphing upon an average only about 600 words per hour. Conceding that by the Duplex the capacity of the wires and operators is doubled (which it is not), would give an average of only 1,200 words per hour, against a conceded performance of the Automatic equal to about 36,000 words per hour! It must be borne in mind that the statement in regard to the performance of the Morse operators is Mr. ORTON's, not ours.

The Automatic Telegraph Company, for a year or more, has had its lines opened for public business between this city and Washington. During that time the capacity and practicability of the system has been pretty thoroughly tested, and has not been found wanting. The capability of the system of transmitting telegraphic signals as rapidly as is claimed for it having been conceded, the question remains as to the relative speed of perforation and copying the despatches. The President's message, to the transmission of which reference has been made, was actually perforated at the rate of twenty-five words a minute per man. Conse-

quently, eight perforators could prepare the despatch for transmission in one hour. It was copied at the rate of thirty-two words a minute per copyist. Six copyists, therefore, would be required to copy it in an hour. Upon Mr. ORTON'S own statement it required sixteen operators and eight wires to accomplish what could have been done by the same number of operators, *i. e.*, eight perforators, one sender, one receiver and six copyists by the Automatic system, in the same space of time, on *one* wire. This speed was by no means exceptional, and can be largely increased with practice.

This simple statement of *facts* disposes of Mr. ORTON'S *assumption* that it will require at least double, and, judging from English experience, five times the number of operators by the Automatic system to accomplish the same amount of work as by the Morse system.

Mr. ORTON entirely ignores one of the greatest advantages of the Automatic system. If, as is not unfrequently the case, all but one or two wires on a main route, like that between New York and Washington, or between New York and Boston, for instance, are incapacitated for a time, the automatic system would enable one wire to do all the actual transmission required; or where all the wires are prostrated and business accumulates, as it does in these days of almost unlimited use of the telegraph, the messages can be perforated, and as soon as a single wire is restored, they can all be forwarded to the receiving stations in a very brief space of time, whereas by the Morse system, even with the valuable assistance of the Duplex, hours would be required to clear the files.

The length to which this article has extended, and the pressure upon our columns of other matters, compels us to be brief in our allusions to other points in Mr. ORTON'S remarks upon the Automatic system. In the appendix to his communication he asserts positively that, "whatever else the Automatic may be able to do satisfactorily, it is very certain that it cannot handle press matter in the day time." To this it is sufficient to say that it *does* handle press matter in the day time, and, we are informed, is prepared to contract for the satisfactory transmission of press despatches on the route covered by its wires to any desired extent.

The umbersomeness and costliness of the apparatus, even if true, is a minor consideration, and one not difficult to obviate. Its liability to get out of repair we have not investigated, but think it safe to assume that this assertion has no better basis than the other, whose fallacy we have shown.

It is true that the Automatic system is no novelty, and it is also true that a sanguine advocate did, in 1869, publish a pamphlet or pamphlets glowingly setting forth what it had accomplished. We believed and stated then that we considered such publications premature and unadvisable, but that fact did not and does not lessen the real merits of the system. The idea of Automatic telegraphy outdates by many years Mr. ORTON'S accession to the telegraphic service, but until the development of the American system its capabilities and practicability had not by any means been demonstrated. It required the application of the rheostat and condenser, made by Mr. GEORGE LITTLE, to make it practical and reliable for long lines of telegraph.

As to the paragraph in the Postmaster-General's report being a "valuable advertisement," we are assured that the fact that it was to be mentioned by him was unknown to the officials of the Automatic Telegraph Company, and that the system has not been offered for sale or a purchaser been sought.

There are other points which we should be pleased to notice more at length, but we cannot now afford more space therefor. What we have stated we can substantiate at any time. At the same time, it should be understood, that, while conceding the advantages of Automatic telegraphy, and firmly believing that it is to become a most valuable part of the telegraph system of this country and the world, we are not yet convinced that it will either supersede the Morse, or that it affords any argument in favor of a postal telegraph,

such as the Postmaster-General seeks, with so slight prospect of success, to have imposed upon the country. If, by increasing the development of the practical capacity of the wires for business, the cost of telegraphic service can be materially cheapened, private enterprise will not be slow to recognize so important a fact, and private competition will assure to the public the advantage to be derived therefrom.

Death of Professor De la Rive.

THE distinguished Swiss scientist and electrician, Prof. AUG. DE LA RIVE, of Geneva, died on the 27th of November. He was formerly Professor of Natural Philosophy in the Academy of Geneva, and is best known to Americans by his great work on electricity, the first volume of which was published in 1852 and the last in 1858, and which has been translated into English, German and Italian. This work may truthfully be said to have embodied almost everything that was known in relation to electricity up to the time of its publication, and for many years was the standard text-book on this branch of natural science in all the countries of Europe. Some of the later writers on the same subject—in this country especially—have published works whose most valuable portions have been compiled almost literally from DE LA RIVE'S treatise. Prof. DE LA RIVE was several times visited by DAVY and FARADAY, and was an almost constant correspondent of these eminent men. At the time of the annexation of Savoy to France he was sent to England by the Federal Council of Switzerland on an important and delicate political mission. He was a foreign member of the Royal Society of London, a corresponding member of the Academy of Sciences of Paris, and of a large number of other learned societies in the different capitals of Europe.

An Old Friend in a New Dress.

WITH the opening of the New Year our esteemed contemporary, the *American Artisan*, comes to us in a new form and a new dress. Hereafter it is to be published monthly instead of weekly. The January number, the first of the new series, is a large quarto of 32 pages, cut, stitched, and enclosed in a tasteful and elegant cover. It is profusely illustrated, and in typographical appearance is certainly superior to any journal of the kind ever issued in this country. It is filled with useful scientific information of all kinds, and contains many articles of marked ability, written in an interesting and popular manner. The high reputation of its conductors, Messrs. BROWN & ALLEN, is a sufficient guarantee that no pains or expense will be spared to maintain the utmost degree of excellence in the future numbers of the *Artisan*, and we trust that they may meet with the success which they so well deserve. The terms of the *Artisan* are two dollars per year, in advance. Specimens will be sent free, on application to the publishers, at No. 258 Broadway, New York.

The Telegrapher in Canada.

THE telegraphic fraternity in Canada have appreciated THE TELEGRAPHER, and are very generally represented on its subscription list. For this we are largely indebted to the kindness of our friends who have acted as agents and canvassers, bringing the paper to the notice of the fraternity generally.

Mr. JOHN TRENAMAN train despatcher of the Grand Trunk Railway at Kingston, Ontario, has been very efficient in securing the support of the operators employed on the line of the road, and we are under obligations to him for past favors, and commend him to the telegraphic fraternity as an agent of the paper, which we hope he will continue to be for years to come.

We are also under obligation to MESSRS. HUGH NELSON, of the Dominion Telegraph Company, of Toronto, GEO. BLACK, of the Montreal Telegraph Company, Hamilton, J. ATKINSON, of Port Hope, A. B. MUNSON, of Fergus, GEO. W. RAILTON, of Merriton, and others who have rendered valuable service in adding to the circulation of the paper in the Provinces.

We would solicit the continued coöperation of all the old friends of an independent telegraphic journal in not only maintaining but increasing the circulation of THE TELEGRAPHER, and many new ones which we hope to secure from time to time.

International Free Exhibition of Arts and Manufactures.

Mr. GEORGE BLACK, for several years manager of the Montreal Telegraph Company's Hamilton, Ontario, office, has, with Mr. WALTER W. SIMS, agent of the Toronto *Globe*, engaged in a new and novel enterprise, which is likely to prove of much value—it is entitled an International Free Exhibition of Arts and Manufactures. They propose the establishment of a permanent free exhibition and general sample and advertising agency in the City of Hamilton, and all the cities of the Dominion, for introducing, exhibiting and advertising the manufactures, wares, etc., of the Dominion, Great Britain and the United States. Premises have been secured at No. 73 James street (North), Hamilton, Ontario, and other agencies will be opened as rapidly as possible.

This enterprise should meet with encouragement and success. Mr. BLACK'S experience and ability as a telegrapher will enable him to deal intelligently and successfully with telegraphic and electrical instruments, inventions and apparatus, and we have no doubt but that our American manufacturers will find it for their interest to communicate with and patronize him.

Circulars and all required information may be obtained by addressing BLACK, SIMS & Co., drawer 49, Post-office, Hamilton, Ontario.

Appointment of Secretary and Treasurer of the Gold and Stock Telegraph Company.

ON the 1st inst. the office of the Atlantic Telegraph (Cable) Co. in this city was closed, and Mr. HENRY H. WARD, who has for several years filled the position of Supt. of the New York, Newfoundland and London Telegraph Company, which has been merged in the Cable Company, retired from the service. He has been appointed Secretary and Treasurer of the Gold and Stock Telegraph Company, of this city, and assumed the duties of his new position on the 1st of January.

Mr. WARD has filled several important telegraphic positions during the many years of his connection with the business, all of which he has filled with much ability and credit to himself. His services to the Gold and Stock Company will be very important and valuable, and his duties will be discharged with the ability, faithfulness and courtesy which are characteristic.

Titlepage and Index to Vol. IX.

THE Titlepage and Index to Vol. IX of THE TELEGRAPHER will be furnished with this week's number. Should any one who desires fail to receive them, copies can be had on application to this office.

Personals.

Mr. W. N. McCORMICK has accepted a position in train despatcher's office at Fort Wayne, Ind., on the P., Ft. W. and C. Railroad.

Mr. J. A. PATTERSON has resigned the position of train master and superintendent of telegraph of the Cairo and Vincennes Railroad, and Mr. T. E. CLARKE has been appointed to fill the vacancy.

Mr. J. H. POWERS has resigned his situation with the Western Union Company at Chicago, Ill., and accepted a situation with the Pennsylvania Railroad Company at Elizabeth, N. J.

Mr. C. M. GREENE has been appointed division operator of the Minnesota Division of the Northern Pacific Railroad, with headquarters at Brainard, Minn.

Information is desired, and, if possible, the present address of Mr. WILLIAM J. COWAN, formerly telegraph operator at Crook Haven, Ireland. Any person who can give such information is requested to address Mr. PHIL. P. HAUFF, Atlantic and Pacific Telegraph Company, 198 Broadway, N. Y.

Mr. CHARLES R. HOSMER, who has ably filled the position of manager for the Dominion Telegraph Company at Buffalo, N. Y., for two years past, has been

promoted to be Superintendent of the Eastern Division of that company, with headquarters at Montreal, Ca.

Mr. CHARLES A. TINKER, general train despatcher, has been appointed Superintendent of Telegraph for the Central Vermont Railroad Co., and all telegraph lines belonging to or connected with the interests of that company are placed under his charge.

The Telegraph.

Foreign Telegraphic Notes.

Messrs. HAMBRO & SON, of London, England, have announced the payment, on the 1st of January, of interest at the rate of five per cent. per annum, on the shares of the Great Northern Telegraph Company.

We are told by the *London Times* that it may be some time before the nation learns the total cost of the purchase of the telegraphs by the State. The materials for calculation are, at present, £5,847,347 returned as paid to "Telegraph Companies;" £865,559 returned as paid, or due to "Railway Companies," up to the 15th of July, 1873; and such proportion of the £5,000,000 said to be the amount of claims outstanding as may be eventually ascertained, by arbitration or otherwise, to be due.

The total number of messages forwarded from postal telegraph stations in the United Kingdom, during the week ended the 13th of December, 1873, was 338,742—an increase over the corresponding week of the previous year of 47,625.

The Eastern Telegraph Company's traffic receipts for the month of November, 1873, amounted to £35,096, against £33,667 in the corresponding period of 1872.

The Eastern Extension, etc., Telegraph Company state that the receipts of their lines for the month of November, 1873, amounted to £17,454, against £15,991 for the corresponding period of 1872 of the four separate lines, viz: British-India Extension, China Submarine, British-Australian, and Tasmanian Submarine Telegraph.

Telegraphic and Electrical Brevities.

The new telegraph line for the United States Signal Bureau, between Norfolk, Va., and Cape Hatteras, reached a point, on the 7th inst., twelve miles below Cape Henry, and is being pushed rapidly to the dangerous coast of Hatteras.

A severe sleet storm, on Wednesday last, prostrated all the telegraph wires west of Pittsburgh, Pa., and suspended telegraphic communication with the West. The wires were badly damaged in all directions west.

Promoted.

It is with pleasure that we note the promotion of Mr. James J. Riegel from the position of station agent at Bingen, North Pennsylvania Railroad, to the charge of Old York Road Station, on the same road, about seven miles from Philadelphia. In his new position Mr. Riegel will take charge of the ticket and telegraph offices, also will act as freight agent and agent for the Central Express Company. Mr. W. W. Sell, assistant station agent at Doylestown, will succeed Mr. Riegel in charge at Bingen. These promotions will go into effect to-day, and are as deserved as they are gratifying to us to publish them.—*The Morning Progress*, South Bethlehem, Pa.

SHOULD men be indulged in ungentlemanly, profane or obscene language over telegraph lines?

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended December 9, 1873, and bearing that date.

145,303.—ELECTRIC SIGNALING APPARATUS FOR RAILROADS. Frank L. Pope, Elizabeth, N. J. Application filed April 2, 1873.

For use at tunnels, drawbridges, etc., one line of rails divided into insulated sections, the other in connection with earth. System of repeaters at each end of, say, tunnel. Train going in one end sets a primary signal at far end, which signal repeats back and sets a secondary signal at entrance. Train on its exit closes certain circuits, reversing the signals.

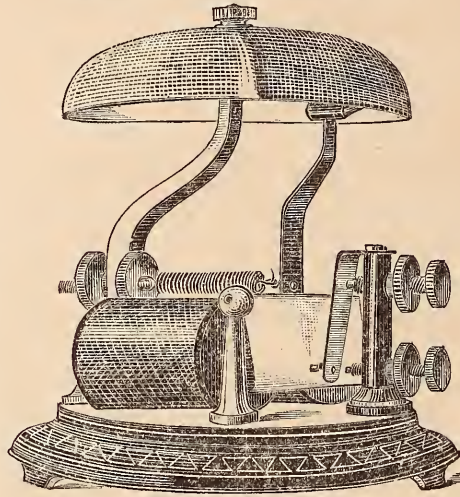
1. The combination of the electro-magnet C', electro-magnets B B', circuit breaking levers b b', and circuit closing devices a1 and a2, substantially as and for the purpose herein specified.

2. The combination of the magnet C' for operating a primary signal, the magnet D for operating a secondary signal and a circuit closer, a1, the latter arranged to be actuated by the passage of a train, substantially as herein described.

3. The combination and arrangement of the electro-magnets B and B' and armature levers b and b', so arranged that the closing of the circuit through one magnet will break the circuit of the other, substantially as herein specified.

4. The arrangement of a primary signal magnet and a secondary signal magnet at each end of a section of railroad track, each secondary signal magnet being controlled by the action of the primary signal magnet at the opposite end, substantially as and for the purpose herein specified.

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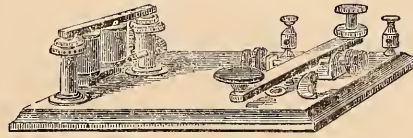
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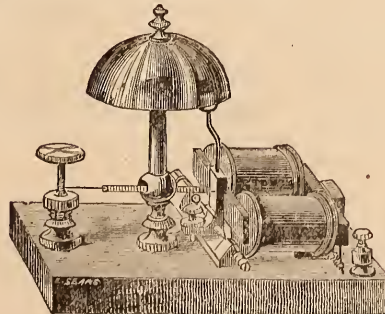
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Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and

their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE,

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
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P. O. BOX 496.

A MERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

EFFICIENCY AND RELIABILITY.

Address—
American Compound Telegraph Wire Co.,
ALANSON CARY, Treasurer,
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY

HOWARD WATCH AND CLOCK CO.

E. HOWARD, & CO., Proprietors.

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OFFICES:

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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH

in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,

which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS

of all kinds,

CHRONOGRAPHS,

ASTRONOMICAL CLOCKS,

REGULATORS,

ETC., ETC.,

OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES
OF
EVERY DESCRIPTION,
38 VESEY STREET, New York.

NEW AND SUPERIOR PATTERNS OF

STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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CLEVELAND, O.,

MANUFACTURERS OF

TELEGRAPH INSTRUMENTS

OF EVERY DESCRIPTION.

Agents and Manufacturers for

THE AMERICAN FIRE ALARM, GAMEWELL & CO., N. Y.

Specialties made of

HICKS' REPEATERS, HICKS' RELAYS,

SURE-CONTACT KEY, "NOVELTY" SOUNDER,

Cheap Instruments for Learners, Amateurs, &c.,

NEW GRAVITY BATTERY,

Hotel and Private House Electric Annunciators,

BURGLAR AND FIRE ALARMS,

Dial and Printing Instruments for Private Telegraph Lines,

CALL BELLS AND ALARM BELLS of every style.

Batteries, Chemicals, Wire, Insulators, Supplies, &c., &c.

MODELS and LIGHT MACHINERY made to order.

PRICE LIST.

Hicks' Repeaters (1873.)	.....	\$100.00
Hicks' Relays	..... from	\$12.00 to 18.00
Main Line Sounders	.....	12.00 " 19.00
Local Sounders	.....	3.50 " 8.00
Keys	.....	3.00 " 6.50
Learners' Outfits (complete)	.....	7.50 " 10.00
Dial and Printing Instruments	75.00 " 225.00
Annunciators, per room	7.00 " 12.00
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Sec'y and Treas.,

No. 4 LEADER BUILDING,
CLEVELAND, O.

DR. L. BRADLEY,
No. 9 Exchange Place,

JERSEY CITY, N. J.,

Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60. Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

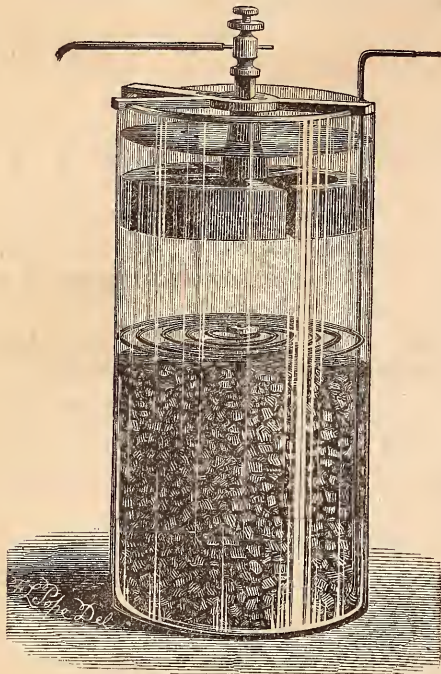
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraph and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any attention whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a
LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

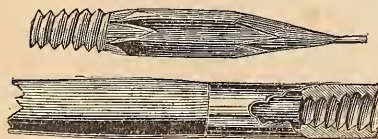
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

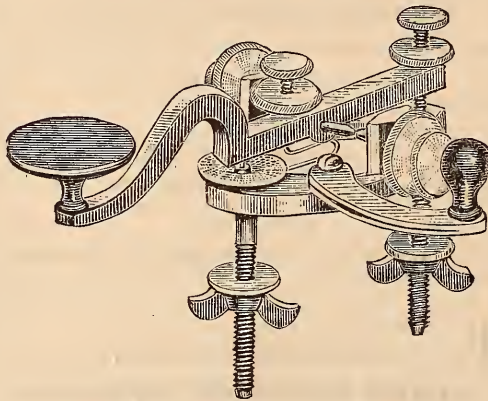
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41 Third ave., Chicago, Ill.

WATTS & COMPANY,
47 Holliday Street,
BALTIMORE,
MANUFACTURERS OF
ELECTRICAL AND TELEGRAPH INSTRUMENTS
AND
Material of Every Description,
RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.
Nickel Plated Goods a Specialty.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



Price, \$5.50 plain; \$7 nickel plated.

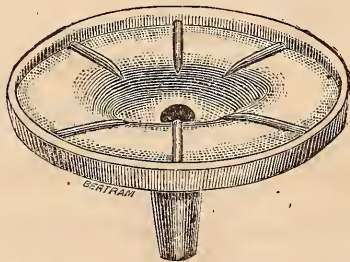
The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK, }
Sept. 23d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,

A. S. BROWN, Manager.



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

SWITCHES, GALVANOMETERS, RESISTANCE COILS, &c., to order.

Designs for Switch Boards for special service furnished.

SCOTT'S PATENT ANNUNCIATOR,
for Hotels and Residences.

PARTRICK, BUNNELL & CO.'S
CHAMPION LEARNERS
AND
SHORT LINE TELEGRAPH APPARATUS.
A GREAT IMPROVEMENT

over all Instruments of the kind ever offered for this purpose, consisting of a

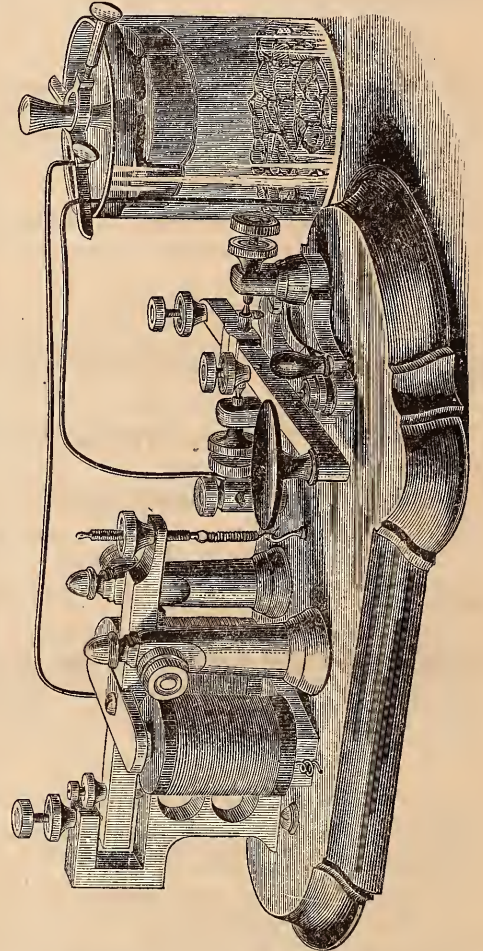
No. 1 SOUNDER AND KEY COMBINATION SET,

AN EXCELLENT BOOK OF PRACTICAL INSTRUCTION IN
TELEGRAPHY,

OFFICE WIRE, CHEMICALS, ETC.,

making a complete arrangement for one office.

The Instruments are full sized, complete in every respect. The Battery is a full sized first class Callaud cell, and the entire outfit has nothing about it which in any way resembles the many wretched affairs which have been extensively sold as Learners' Apparatus.



Great numbers of our "Champion Instruments" are in use upon short private lines, and upon City wires of Telegraph Companies, where they are giving the greatest satisfaction, on account of their very substantial make and excellent working qualities.

We guarantee them to be in every respect better than any form of Learners' Apparatus or Short Line Instruments ever offered to the public.

Price of Apparatus, complete, with Book of Instructions, Battery, Wire, and all necessary materials for one complete office outfit, ready for shipment, sent C. O. D., \$10—or, if money order sent for the amount, \$9.50. The latter plan will additionally save the purchaser the express charges for the return of money.

Price of Single Instrument, good for one mile or less, without Battery..... \$8 50

Ornamental style ditto, with rubber covered coils, without Battery..... 10 00

Single Instrument, good for working a line from one to twelve miles..... 9 50

Ditto, ornamental, with rubber covered coils..... 11 00

Battery, per cell..... 1 50

PARTRICK, BUNNELL & CO.,
38 SOUTH FOURTH ST., PHILADELPHIA,
MANUFACTURERS OF
TELEGRAPH & ELECTRICAL INSTRUMENTS
and Supplies of every description.



Vol. X.

New York, Saturday, January 17, 1874.

Whole No. 392

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 MANUFACTURER OF
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 OF ALL KINDS,
 GALVANIC BATTERIES,
 JONES' PATENT LOCK SWITCH,
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 ALSO, ON HAND AND FOR SALE,
D. W. PUTT & CO.'S Mechanical Telegraph
 Instruments,
 "Pope's Modern Practice of the Electric Telegraph,"
 AND A FULL ASSORTMENT OF
 TELEGRAPH MATERIALS AND SUPPLIES.
 AT THE LOWEST PRICES.

CANADIAN TELEGRAPH SUPPLY
 MANUFACTURING COMPANY,
 MANUFACTURERS OF
 All kinds of Electrical Instruments
 AND
 TELEGRAPH SUPPLIES.
 All orders promptly filled, at reasonable prices.
 Office and Factory,
 352 and 354 KING STREET, WEST,
 Toronto, Ont.

NOVELTY!
 A **SOUNDER** of Entirely New Construction,
 which gives with the usual amount of battery a very heavy and
 clear sound.
 SIZE FOR REGULAR OFFICES..... \$5 00
 SMALL SIZE..... 3 50
 LEARNERS' OUTFITS, with small size Sounder, Key,
 Battery, Chemicals, Wire, Instruction Book, &c.,
 all complete..... 7 50
 Send for Circular.
TELEGRAPH SUPPLY AND M'FG CO.,
 No. 4 LEADER BUILDING,
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CHARLES WILLIAMS, JR.,
 (ESTABLISHED 1856.)
 109 Court Street, Boston,
 has for sale the various kinds of Office and Magnet Wires, in-
 cluding Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and
DAY'S KERITE COVERED WIRE.

COVERED WIRES,
 Made from Lake Superior Copper, warranted strictly
 pure, covered with Hemp, Flax, Linen, Cotton, Silk or other
 material, for Telegraph Instruments, Electro-Magnetic Machines,
 Philosophical Apparatus, and all kinds of Electrical Purposes.
 Also, PLAIN, WOVEN, ENAMELLED, SHELLACED,
 PARAFFINED, and all kinds of
TELEGRAPH OFFICE WIRES.
 Also, Telegraph Switch Cords,
 many Patterus, Plain, Woven and Braided. Parties being partial
 to any particular kind need only enclose a small specimen in a
 letter and it can be imitated in every particular.
 CONDUCTING CORDS, POLE CORDS, TINSEL.
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 (SUCCESSOR TO JOSIAH B. THOMPSON),
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 535 & 537 CHINA STREET,
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 MANUFACTURERS OF
INSULATED WIRES.
 OFFICE WIRE—Plain, Braided, Prepared, &c.
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 FLEXIBLE CORDS, all kinds, &c., &c.

We warrant all Wire to be of the highest conductivity, tested
 by our Galvanometer, which compares with the tests of the
 highest authority in this country.

REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL
TELEGRAPH APPARATUS,
 For **AMATEURS, STUDENTS and SHORT LINES.**

Since the introduction of this *Pioneer Low Priced Telegraph In-*
strument, a little over a year and a half since, nearly 2,000
 have been sold, and they are constantly more and more sought
 after.
 Hereafter we shall furnish them at the following popular rates:
 Single Instruments, including Three Cells Battery, Con-
 necting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00

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SITUATION DESIRED.
 A Situation is desired by the subscriber as a Telegraph Operator.
 She has had nine years' experience, and has filled responsible
 positions in Commercial and Railroad offices satisfactorily, but
 is at present without an engagement. Would prefer a situation
 in an office in some city, or place of moderate size, where she
 could have an office by herself—either in a Commercial or Rail-
 road office.
 Any person knowing of such a situation, or desirous of engag-
 ing her services, will please address
 Miss A. NIXON,
 Hobart, Lake County, Indiana.

A NEW GALVANIC BATTERY.
Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
 PATENT APPLIED FOR.
 The undersigned having secured the exclusive Agency for the
 manufacture and sale of the
EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic
 and other purposes yet devised.
 The Battery cell is made of lead, and forms one pole of the
 battery. Sulphate of copper is the only chemical required to be
 used.
 These Batteries have been fully tested during the last year,
 although only recently offered for sale, and have proved to be
 superior to any other as regards efficiency, economy and dura-
 bility. When once set up they require no attention for from
 four to six months, according to the service required of them.
 Two sizes are made at present, but others will soon be ready.
 No. 1 is a large square cell, and can be used as a local or for
 running motors. Price, \$2.25.
 On Locals, one No. 1 cell is used in place of two Daniells, at a
 saving of nearly one half in cost.
 No. 2 is a round cell, designed for main line. Price, \$2.
 Descriptive circulars and price list forwarded upon applica-
 tion to

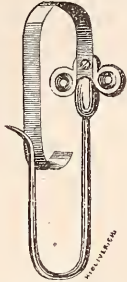
F. L. POPE & CO.,
 (P. O. Box 5503.) 38 VESEY STREET, N. Y.

CALLAUD BATTERIES
 KEPT ON HAND, AND ORDERS FILLED BY
W. MITCHELL McALLISTER,
 728 Chestnut Street, Philadelphia,
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 AND BY THE
WESTERN ELECTRIC MANUFACTURING CO.,
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 MANUFACTURERS OF
BRASS, COPPER & GERMAN SILVER WIRE.
 Also, BRASS, COPPER and GERMAN SILVER,
 in the Roll and Sheet.
 We make the manufacture of Electric Wire a specialty—
 especially the finer sizes of Copper for conduction, and German
 Silver for resistance purposes—guaranteeing the conductivity of
 the same in every instance to be superior to that of any other
 manufacturer in the market.
WAREHOUSE,
 89 Chamber Street, N. Y.
MANUFACTORY,
 Ansonia, Conn.

ALLEXANDER L. HAYES,
Late Assistant Examiner of Electrical and Telegraphic Apparatus,
U. S. Patent Office),
SOLICITOR OF PATENTS,
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SECURITY MESSAGE HOOK.



PATENT APPLIED FOR.

The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.

Price.....30 cents each.
" per dozen.....\$3.00.
Liberal terms to the trade.

GEO. H. BLISS & CO.,
41 Third Avenue, Chicago, Ill.,
General Agents.

SECOND-HAND RELAYS.

A large lot of well polished and good working Relays for sale very cheap; also, several sets of

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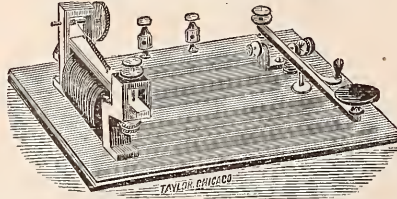
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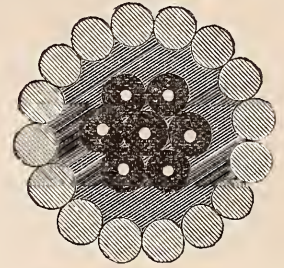
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THE TELEGRAPHER

A JOURNAL OF ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JANUARY 17, 1874.

VOL. X. WHOLE No. 392.

Original Articles.

The Elementary Principles of Electrical Measurement.

BY FRANK L. POPE.

(Continued from page 2.)

Ohm's Law.

EACH one of the four electrical phenomena that have been described is susceptible of being measured with great accuracy. The essential properties of an electric circuit may be said to be: First, the electro-motive force included or contained in it; second, its resistance to the passage of the current; and third, the magnitude of the current so passing. When any two of these three properties have a known value the value of the third may readily be ascertained.

This is done by means of Ohm's law, upon which all electrical measurements are founded—the importance of which is only equalled by its simplicity. From the fact that it is expressed in most books by algebraic formulæ, students are apt to be very much afraid of it, but there need really be no difficulty in understanding it. Unless he does understand it, the student can make but little progress towards a thorough knowledge of the phenomena of the electric current.

Ohm's law may be briefly stated as follows:

- 1. The current in any circuit is found by dividing its electro-motive force by its resistance.
2. The resistance in any circuit is found by dividing its electro-motive force by its current.
3. The electro-motive force in any circuit is found by multiplying its resistance by its current.
4. The quantity of electricity produced in any circuit is found by multiplying the current by the time during which it flows.

The algebraic formulæ referred to are nothing more than a short way of writing down the same thing, thus:

Let Q denote the total quantity of electricity generated in any circuit.

Let E denote the electro-motive force in the circuit.

Let R denote its resistance.

Let C denote the current flowing in the circuit.

Let T denote the time during which the current flows.

We may then write down the above statements, thus:

(1) C = E/R. (2) R = E/C. (3) E = RC. (4) Q = CT.

For the benefit of those not familiar with algebraic formulæ, it may be well to state that, when two letters standing for numerical quantities are placed one above another in the form of a common fraction, it signifies that the quantity above the line is to be divided by the quantity below the line.

Thus E/R signifies E divided by R.

The sign = denotes equality; or that the quantities on one side of the sign are equal to those on the other side.

When two or more letters standing for numerical quantities are written together, one after the other, it signifies that they are to be multiplied together. Thus, in the above case, the expression E = RC means that E is equal to the product of R multiplied by C, or, in other words, that the electro-motive force (E) is equal to the resistance (R) multiplied by the strength of current (C), which is exactly what was stated above in the third paragraph of Ohm's law—only in the former case it required 78 letters to explain it, and in the latter case we express precisely the same thing by means of four letters and one arbitrary sign, which, perhaps, may serve to give the student some idea of the reason why persons who understand algebra prefer to use it whenever circumstances permit.

Units of Electrical Measurement.

In order to measure anything we must first provide ourselves with suitable known standards or units of measurement with which the unknown quantities may be compared. Thus, in measures of space, we have the inch, in measures of time, the second, and in measures of force or weight, the pound.

The first well defined and accurate unit of electrical measurement proposed, which met with much general acceptance in practical work, was the resistance unit of Dr. Werner Siemens, of Berlin, Prussia, which he constructed in 1860.

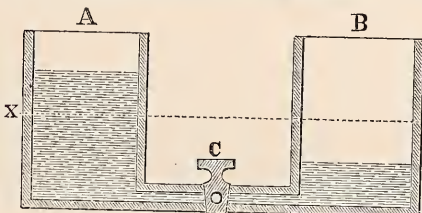
The Siemens unit is defined as being equal to the resistance of a column of chemically pure mercury, one metre in length and one square millimetre in sectional area, maintained at a temperature of 0° Centigrade or 32° Fahrenheit. No definite standards of electro-motive force or of quantity have ever been authoritatively established in connection with the Siemens resistance unit. The ordinary Daniell cell furnishes a unit of electro-motive force of sufficient uniformity and constancy for ordinary purposes, and one which is used in this way very generally by practical electricians.

A complete system of electrical units has more recently been established by the British Association for the advancement of science, which are usually known as the B A units. They are as follows:

The Volt is the unit of electro-motive force. It does not differ greatly from the electro-motive force of a single sulphate of copper cell, and for many purposes may be considered equivalent to it. According to Mr. Farmer's determination, the sulphate of copper battery generally used in telegraph work has an electro-motive force equal to 0.93, or 93/100 of a volt.

The Ohm is the unit of resistance. It is equal to the resistance of a round wire of pure copper 1/100 of an inch in diameter and 408 feet 4 inches in length, at a temperature of 60° Fahrenheit. This is the size generally known as No. 16 wire, Birmingham gauge. Roughly, it is about equivalent to the resistance of 330 feet of ordinary No. 8 galvanized wire, such as that used in the construction of telegraph lines. The ohm and the Siemens resistance unit before referred to do not differ greatly from each other. According to the most trustworthy determination 1 ohm is equal to 1.0486 Siemens units, and 1 Siemens unit is equal to 0.9537 ohms.

The Farad is the unit of quantity and of electro-



static capacity. It is equal to the quantity of electricity that will pass through a circuit having a resistance of 1 ohm during 1 second, with an electro-motive force of 1 volt. The use of the same unit for quantity and capacity is a matter that seems somewhat puzzling at first sight, but if we refer to our former illustration in figure 2, the propriety of it becomes apparent. The capacity of the vessel A above the line xx may be for one gallon, and, in that case, the quantity of liquid contained in it when it is full, will also be one gallon.

The Weber has been proposed, by some writers on the subject, as a unit of current, and is defined by them as equal to the quantity of electricity that will pass per second in a circuit having an electro-motive force of 1 volt and a resistance of 1 ohm. The necessity of a distinctive name for a unit of this description is not very apparent, and would seem rather liable to create confusion of ideas than otherwise. Fleeming Jenkin, who is probably the best authority on the subject, gives one farad per second as the unit of current, and it is probable that his definition will be the one ultimately adopted. It has the merit of being capable of comprehension, at all events, and when we speak of a current of so many farads per second, the idea conveyed is as distinct as it would be if we spoke of a current of water of so many gallons per second.

The ordinary Callaud cell usually has about 3 ohms resistance. If such a cell were placed on "short circuit," that is, having its poles connected by a wire so thick as to offer no appreciable resistance, the current traversing the circuit would be equal to one third of a farad per second. One sixtieth of a farad per second is sufficient to operate the relays in the main circuit of a telegraph line. A local circuit for actuating a sounder or register usually has a current of from one fourth to one sixth of a farad per second. When a

1 So named from the Italian philosopher, Volta, the discoverer of the Voltaic battery.

2 According to the same authority the mean electro-motive forces of some of the cells in common use are as follows: Bi-Chromate Carbon... 1.75 Volts. Grove... 1.63 " Bunsen... 1.59 " Smee... .62 "

3 So called in honor of Dr. G. S. Ohm, who was the first to discover and lay down the true laws of electrical action.

4 So called in honor of the English philosopher, Michael Faraday, distinguished for his researches and discoveries in electrical science.

current of a certain number of farads is spoken of, the words per second are, of course, understood.

The wide variation in magnitude of the different quantities dealt with by electricians—such for example as the ratio of resistance between silver and gutta serena, before alluded to—renders the use of multiples and submultiples of the above units very convenient in practice. The names and values of these are as follows:

- 1 megavolt = 1,000,000 volts.
1 megohm = 1,000,000 ohms.
1 megafarad = 1,000,000 farads.

Similarly—

- 1 microvolt = 1/1,000,000 of a volt.
1 microhm = 1/1,000,000 of an ohm.
1 microfarad = 1/1,000,000 of a farad.

(To be continued.)

"The Ghost."

VERY likely it is not generally known outside of New York that the Western Union office at No. 145 Broadway is haunted—but such is the mournful fact—the apparition, however, taking the most unostentatious and frugal form of a blank hook, of godly dimensions, and the cover of which appears the following announcement:

"TELEGRAPHICA'S GHOST." Vol. 1.

A manuscript chronicle of events occurring in and in connection with the general office of the W. U. Telegraph Co., New York, and a medium of communication between operators in quest of "subs" or "subbing," edited by W. P. PHILLIPS,

and engrossed by the best penman that can be induced to engage in the work.

New York, Jan. 1st., 1874.

On the fly leaf appears the appended lines, which explain themselves:

When Telegraphica's spark expired, In bonny, blossoming June, Many kind voices hastened to say, "Its being has closed too soon."

And though it never has returned Through all the months now fled, It has staid away, with reason, And now sends its ghost instead.

As its founder sat pondering, Christmas night— The season when spirits hold full sway— This ghost came down through the chimney pot And in hurried accents went on to say:

"Haste—oh! haste thee, and bring me a dress From some neighboring blank book store, That I may remain, for a time at least, And breathe the earth's air once more."

These were the words of the spirit, And this is the dress that was got; May it prove a cheerful kind of a ghost, This sprite of the dash and dot.

P. S.—The phantom requests, in blindest tones, It be asked of the "powers that be" That it be allowed to "lay around here," That all may its pages see.

Below are given a variety of extracts, calculated to show the field in which the "Ghost" is calmly stalking, and the way it "chins" the boys about matters and things in general:

"The glad New Year—the great, the important day to New Yorkers, big with the fate of calls, of cake and wine—is here once more. Last night we telegraphic knights nocturnal listened and heard old Trinity ring out the chimes of requiem for dead '73, and felt with gladness that the new horn year was ushering in. How easy to look back across the short expanse when last year's infant note was pealed upon the air! How easy to peruse the page on which the events of the past twelve months are written! The leaf is scattered o'er with marks awakening sad memories, vain regrets and sweet remembrances. But we peer into the future to no purpose; the wee bairn tells us naught of what's to come. In its cycle it will surely bring marriage, births and death; failure and success; defeat and victory; which, and to whom, we may not know as yet. And still a little further on new chimes will ring out on the midnight air; the calls, the cake and wine again will be in order, and our familiarity with the finished page of '74 will make us marvel that its great events were but so shortly enshrouded in mystery and gloom!"

"The force list for New Year's day, which has been tastefully drawn up by Mr. Dolan, is embellished with three significant etchings by Mr. J. J. Callahan. The first represents a day man astride a horseshoe magnet, the speed of which is evidently retarded by a 'home resistance,' composed of the smell of poultry in the pan, the smiles of wife and children, and a natural longing to gather round the hearth on New Year's day. The anxious fellow is slowly bearing down on 'No. 145,' though his eyes are eagerly turned towards the clock which looms up on Trinity, and as he notes the fact that its hands point to precisely eight o'clock, he sinks his imaginary spurs into his

flankless steed and gasps: 'I wonder if I'm on the reserve?' The next depicts an office scene, in which the operators seem to have taken several steps backward in the direction of primitive man, as Darwin pictures him. Bills and web feet, as well as claws, are noticeable, suggesting that a diet somewhat poultryish has had a queer effect. There is a great effort making to clear the hooks, in order to assist at a discussion of a monster 'phoni,' which a sable seignor is bringing in, indicating that primitive man or nothing is the object to be achieved. The last of the group is a picture of an 'owl,' on whose front—it can hardly be called a face—despair is visibly imprinted, as he spasmodically ejaculates, after the manner of Mr. Jingle, 'no pens—can't draw on the 10th—broke!' It may be well to state, for the benefit of a benighted posterity, that with the close of 1873 the system of paying salaries on the first, tenth and twentieth instants, so long in vogue, is abandoned, and hereafter the first and fifteenth instants will be the only days on which the telegraphic mind will generally contemplate the purchase of the Windsor Hotel, the completion of our gorgeous Court House, or indulge in meditating an expenditure in other ways of accumulated shakels."

"Our genial friend, Mr. Op. St. Mq. Weller, seems to flourish with his wonted luxuriance since entering the state connubial. Indeed, he is unusually majestic since he became one of the day force. We have no information to the effect that he meditates becoming one of the Brooklyn Board of Aldermen, but, even in the absence of such information, we cannot refrain from saying that he is rapidly building up a *physique* which would do honor to a representative from Gowanus."

"The current number of *Harper's Magazine* has an interesting article on the manner in which press business is conducted among the Washington correspondents. There are several illustrations, one of which represents 'Newspaper row,' with the Western Union Telegraph and Associated Press offices, which are in the same building, occupying a conspicuous place. There is also a cut entitled 'Rushing for the Wires,' in which our 'C. W.' Washington office is well depicted. Likenesses of Ben. Perley Poore, the famous correspondent, L. A. Gobright and J. W. Simonton, lend the article peculiar attractions to the telegraphic eye."

"We hereby make Mr. Thomas R. Taltavall one of our most gracious bows. It is to him we are indebted for all the ornamental work that has entered thus far into this remarkable history, including the tasteful lettering on the cover and the careful execution of the verses. When we contemplate the finish, the grace and the symmetry of Mr. Taltavall's work, and compare it with our original copy of the same, which was about as shaggy as a buffalo robe, we realize how competent he is to change chaos into order, and removing our cap reverentially, we pretend to blow our proboscis while we really shed a 'briny' over our shortcomings."

The engrossing is neatly and skilfully done by Mr. Thomas J. Bishop, and the "Ghost," naturally enough, has been an object of great interest since its advent. The management, it is hoped by those interested, will not manifest a disposition to deny it the coveted privilege to

"——— 'lay around here,'
That all may its pages see."

The New Central Telegraph Office in London.

THE *Telegraphic Journal* of Dec. 15th contains an engraving of the magnificent new building, now nearly completed, which is to be occupied as the central station of the Postal Telegraph system in London. The exterior is very handsome, being ornamented with columns, and cornices, and mouldings, in the *renaissance* style, executed in sufficiently bold relief to break up the front, so as to produce a pleasing effect. In style the building forms as strong a contrast to the new office of the Western Union Company in this city as could possibly be imagined, though, to our fancy, the latter is the most effective of the two. We copy a portion of the *Journal's* description of the new building:

"The material used is granite as high as the ground floor, and above that Portland stone. The building is 300 feet long by 90 feet wide, and forms a parallelogram pierced with two central courts, which are the secret of the plentiful supply of light. The ground, first and second floors are taken up by the different offices of the departmental staff, from the Postmaster General's rooms downward. The ledger room on the ground floor is of fine proportions, and very handsome with its pillars and mouldings of white stone, but the principal feature of the building is the great telegraph room, by far the largest in the world, occupying the whole of the upper floor. Its area is 20,000 square feet, and there are two thirds of a mile of mahogany instrument tables. The wires are already laid from the main lines into the room, which is at present a sort of electric siding to the telegraph system of the country.

When all is ready the telegraph street wires will be cut, and the stream of messages turned into the new office. The countless ends of wires growing through the mahogany tables will each be connected with an instrument, and beside each instrument a card fixed in a stand will give the number of the "circuit." These will be, as far as possible, distributed geographically, Scotland and Ireland being in one corner together, so that the room will be a sort of telegraphic map. All the wires are gathered together at the "test box," a neat array of "terminals." To these terminals the 440 wires are led from out of doors, and then on the instruments at the tables—the object of having all the wires together at one point in the building being to enable the engineer to alter the service, as may be necessary. Each terminal being numbered, the route of the wire is known, and it can be used when wanted in making up a fresh circuit, or line of direct communication. Every evening the telegraph service of the country is altered for press purposes—ordinary wires, no longer wanted for private messages, being joined together to make lines of direct communication with towns in need of newspaper matter. There is, for instance, no direct communication with Darlington during the day, public messages being repeated from one place to another till they reach it; but at six o'clock the Darlington *Echo* begins to want its news, and the direct line or "circuit" necessary for the quick and economical transmission of the long press messages is made up for the benefit of the *Echo* by joining a London and Sheffield, a Sheffield and Leeds, and a Leeds and Darlington wire. A Darlington and Newcastle wire is also joined on, so that the same information may at the same time reach another journal. When Mr. Bright delivered his recent speech at Birmingham a similar arrangement and diversion of wires enabled his speech to be telegraphed simultaneously by 12 automatic and 17 Morse instruments—one of the former being equal to two of the latter. Altogether, 150,000 words, or matter equivalent to more than 90 large print columns of *The Times*, was telegraphed from Birmingham that night between 9 P. M. and 2 A. M. The numbers on the brass finials of the test box in the telegraph room of St. Martin's-le-Grand indicate the route as well as the destination of each wire. Thus Liverpool has in all no less than 17 wires, of which eight go by the London and Northwestern Railway, six by the Great Western, and three by the Grand Junction Canal. Of the thin green paper tape, dotted with telegraphic strokes, no less than 10,000 miles a month are used throughout the kingdom. The color is chosen as being less trying to the clerks' eyes. Even these 10,000 monthly miles of telegrams are not nearly all, for they do not represent the messages of the sight and sound instruments, of which there are 6,000 in use, as against 1,500 automatic or reording instruments.

All along one side of the great telegraph room are ranged the curved leaden tubes and brass fittings of the pneumatic delivery apparatus. Eighteen miles' length of this pneumatic tubing are laid to twenty-five telegraph stations in the city and Westminster, which can thus deliver their telegrams at the Central Office in parcel form faster than the messages could be sent by wire. The messages are enclosed, twelve or sixteen at a time, in despatch tubes, which are shot along the exhausted pipe to the counter of the Central Office. From the counter they are carried to the check table, whence they are distributed, partly by messengers and partly by travelling tapes, to the clerks at the instruments. The Post-offices being the only collectors and distributors of messages, telegrams for the cables and lines of private companies come to this central office, and are sent thence to the offices of the companies by pneumatic despatch. The 440 wires working directly from the telegraph room are in communication with upwards of 1,000 stations. The battery room on the basement will have 25,000 battery cells, and here, again, the wires are collected together at a test box studded with innumerable brass finials. There is 300 miles, length of gutta percha covered copper wire within the building.

Leaving the spacious and handsome instrument room (the telegraphic workshop and executive are lodged on the same floor), we notice through the windows the great chimney rising from the boiler house built in the floor of the south court. Descending a staircase under a handsome skylight, we pass the departmental offices of the lower floors, and turning along corridors, always well lighted, descend to the engine house, on the floor of the north court. Here there will be three engines of 50 horse power each, for the pumping work of the pneumatic tubes, and two of 10 horse power, to draw water from the well of 400 feet deep which is being sunk on the premises. This well will soon repay its cost, and even the 50 horse power engine on Telegraph street spends close upon £600 a year in drink. The new offices will have cost altogether when complete about £450,000, of which £300,000 has been swallowed up by the site. We rejoice that the administration at the Post-office of so distinguished a man as Dr. Lyon Playfair commenced at the time of the opening of this, the greatest telegraphic centre in the world.

[From the *Telegraphic Journal*.]

Mathematics for Non-Mathematicians.

BY W. PAGET HIGGS, LL. D.

DIVISION I.—THE ALGEBRA OF CONSTANT QUANTITIES.

(Continued from p. 313, Vol. IX.)

Limit of Series.

THE powers of a quantity greater than unity increase without limit. Thus, there is no power of 2 but that the next higher power is greater. Improper fractions follow, of course, the same law; thus, $1\frac{1}{2}$ raised to the second power, or $1\frac{1}{2} \times 1\frac{1}{2}$, as it contains the half of one and a half more than one and a half, is greater than the first power. The powers of unity only never increase; but the powers of a proper fraction, or of a quantity less than unity, always decrease. Thus, the powers of $\frac{1}{2}$, viz., $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16}, \frac{1}{32}$, etc., constantly diminish. Representing an integral quantity by x , and a fractional quantity by $\frac{1}{x}$, the powers of the first, or x^2, x^3 , etc., continually increase, while the powers of $\frac{1}{x}$, viz., $\frac{1}{x^2}, \frac{1}{x^3}$, etc., diminish in value. Thus, with the series

- x, x^2, x^3, \dots, x^n , etc., we have the following conditions:
- I. An increasing series, if x is greater than unity.
 - II. A decreasing series, if x is less than unity.
 - III. A series whose terms are all of the same value, when $x = 1$.

In the first and third cases, the sum of the series may evidently be made as great as we please by the addition of more terms. But where x is less than unity this may or may not be possible.

If we take the decreasing series,
 $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32}$, etc., the sum of this series will constantly approach 2, but will never attain that value. It will always be necessary to add the last term to obtain the value 2. Thus,

$$(1 + \frac{1}{2}) + \frac{1}{2} = 2.$$

$$(1 + \frac{1}{2} + \frac{1}{4}) + \frac{1}{4} = 2.$$

$$(1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32}) + \frac{1}{32} = 2.$$

2 is then the *limit* towards which the series constantly approaches.*

Such a series as $1, r, r^2, r^3, \dots, r^n$, has, then, *always* a limit when x is less than unity. The powers of r are constantly decreasing in value, and the higher the name of the power the lower its value. Let n be a very distant term; $\frac{1}{1-r}$ will be the sum. But

$$\frac{1-n}{1-r} = \frac{1}{1-r} - \frac{n}{1-r};$$

whence we see that the more distant is the term n (or, rather, the smaller the fraction, $\frac{n}{1-r}$) the less is $\frac{1}{1-r}$ affected by the subtraction.

$\frac{1}{1-r}$ is then the *limit* towards which the series $1 + r + r^2$, etc., approaches.

The formula given in our last section for the summation of an infinite series was

$$\Sigma = \frac{a}{1-r}$$

where a is the first term. Substitute 1 for a , and we have as well by this method the expression

$$\frac{1}{1-r} = 1 + r + r^2 + \dots + r^n,$$

where $n = \infty$. Whence we perceive that "the sum of an infinite series is the limit toward which we approximate by continually adding more and more of its terms."

GERMAN troopers are now exercised in climbing up telegraph poles, and furnished with instruments to cut the wires. This is, of course, intended for service in an enemy's country, and the work is executed under cover of a dark night. The men are despatched across the country in couples; whilst one of the troopers dismounts, climbs up the pole and cuts the wires, the other holds his comrade's horse, and keeps a look out for any indication of interruption on the part of the enemy.

* But we are not therefore to conclude that every decreasing series has a limit. It is possible to arrange a series (for instance, the reciprocals of the integer numbers in lots, each containing half as many terms as there are units in the denominator of its last term) having no limit.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Telegraphic Progress in Northern Michigan.

BAY CITY, MICH., Jan. 7th.

TO THE EDITOR OF THE TELEGRAPHER.

PERHAPS a brief account of the progress made by the Western Union Telegraph Company, relative to the extension of their lines within the past three years in this woody country, will not be uninteresting to some of your readers.

The excellent manner in which the majority of your correspondents contribute to your columns, tends to throw my efforts in the shade, and almost discourage me from making any attempt to follow their example; however, I will go as far as my abilities will permit. Three years and a half ago (so I am informed by Mr. Cooper, our efficient manager here) there was no such thing as a telegraph line north of Bay City. During the year 1871 the Western Union Company built a line to Au Sable, a distance of 75 miles from here. In 1872 they added 165 miles to this, extending to Mackinaw City. During the year just closed the same line has been increased by an additional 245 miles of wire, together with five miles of cable, which crosses the straits of Mackinaw (and which cost the company \$10,000); thence by overland route to Sault Ste. Marie, Mich., and Marquette, L. S., making a complete circuit, from this point to Marquette, of 490 miles. There are 24 offices along the route, the most important of which are Tawas, Au Sable, Alpena, Cheboygan, Mackinaw, Sault Ste. Marie, White Fish Point and Marquette, which places are all more or less engaged in an extensive lumber business. The line is equipped with five batteries, their respective situations being at Marquette, Sault Ste. Marie, Cheboygan, Alpena and Bay City. It is also well supplied with repairers, there being about half a dozen stationed at various points, at a respectable distance from each other. It should be borne in mind that this line traverses no civilized country—three fourths of it running through woods, and, for 25 miles, between Sault Ste. Marie and White Fish Point especially, where it finds its way through the thick and gloomy forest, devoid of any road save a narrow pathway cut out by the builders when engaged in constructing it. During fine and dry weather we can work through to Marquette (without repeaters) like a charm, and on the same adjustment as if we were working with a neighboring office. Manager Cooper thought he would try an experiment, by connecting this line with one of our Detroit wires. This being accomplished, to our great surprise we had the satisfaction of hearing messages passing through from Detroit to Marquette, and *vice versa*—a circuit of 600 miles without repeaters. This lengthy circuit would only permit of slow and firm manipulation. During this extended circuit a message was sent from Marquette to Chicago, it being repeated at Detroit only, and an answer received at Marquette in precisely eight minutes from the time the first message left the office. I might also state that, to receive an answer to a letter by mail, would require six weeks. As a general rule, the wire is out at Sault Ste. Marie, that office repeating for Marquette; this will necessarily have to be the case during the busy season of navigation.

From the above you will see that Bay City is an important telegraphic centre, inasmuch as it is the repeating office for this extraordinary long wire. Four years ago Bay City was only afforded two wires, one to Detroit and the other to Jackson, Mich., the entire business being conducted by our present able manager, Mr. Cooper. Now we have four wires, two of which connect us with Detroit, one from Saginaw City to Otsego Lake, which is a railroad wire on the line of the J. L. & S. R. R., the other to Jackson, Mich., as before stated. Our force consists of four operators, one of whom, Mr. F. S. Hogan, is entirely devoted to press reports, and is, without any exception, a first class operator. The company also employ a book-keeper and two messengers here, but in the summer we are blessed with three.

Without any exception our office is one of the cosiest and best fitted up in the State. We have a place for everything, and everything is in its place; and, as regards our manager, the only deprecation we can find him guilty of is that he is too lenient with us. Take us on the whole, we are a happy fraternity of telegraphic artists. We are also considerably high toned, inasmuch as that we indulge in the fragrant smoke of Havanas; but should the company deem it advisable to reduce the salaries of their employes ten or fifteen per cent., we would necessarily and very reluctantly (with a sour expression overhanging our pleasant countenances) have to fall back on our brier root

pipes—which would be exceedingly degrading in our own estimation, after the progress we have heretofore attained.

I will close, hoping ere long to say something relative to some further extensions and improvements in telegraphy which will be made in the spring in the northern part of the State.

So far so good for progress, enterprise and perseverance. Q.

The Duplex Telegraph.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE noticed some discussion in the last two numbers of THE TELEGRAPHER in regard to the invention of the duplex telegraph apparatus, and being somewhat familiar with the subject, it is possible that I may be able to throw some light on it. "Inventor" suggests that Mr. Farmer's apparatus, patented in 1858, may have lacked some essential element, by the addition of which, at a later date, the invention was rendered complete and practical.

I have before me a copy of Farmer's patent of 1858. The arrangement figured in the drawings is very much like the "differential duplex" now in use on the Western Union lines. The transmitting circuit breaker is arranged so as to make contact between the battery and line before breaking it between the ground and the line, and is shown in another figure, worked by a local circuit and key. The relay is wound with two distinct wires. In fact, the only essential difference is in the connections, for the same identical apparatus shown in the drawings—the differential relay, circuit preserving key and adjustable rheostat—might be worked either on Farmer's plan or on Stearns', merely by changing the connections. Farmer's drawings also show a duplex repeater, and a differential relay having two magnets opposite to each other, acting on a single armature lever.

It is quite possible that Stearns' arrangement may work better than Farmer's ever did, but it is certain that the latter was worked successfully on lines 300 or 350 miles long at least fifteen years ago. I remember its having been shown to me the first time I was ever in the Boston office, which was in the latter part of 1859. It was a very wet day, but the apparatus was working to Portland as well as could be desired. It was also worked between Cincinnati and Indianapolis (I think) about the same time. Mr. W. Wiley Smith, now of Indianapolis, would probably know all about that experiment. In fact, if I recollect rightly, there was quite a serious effort made to introduce the invention at that time, but there were several reasons why such an effort could not have proved successful. One reason was the wretched character of the lines in those days, not so much from bad insulation—though that was bad enough—as from rusty and imperfect connections, which caused wide and sudden fluctuations in resistance—a condition of things fatal to the satisfactory operation of any duplex system whatever. There was also the fact that such an invention was much less needed then than now. The wires were comparatively few in number and not overburdened with business at that. Then again, there was that old, inveterate prejudice against new inventions, which was considerably more formidable then than now, though even yet it is very far from being extinct. If Mr. Stearns had not himself been President of a telegraph company I have not the slightest idea that he would have been able to introduce his invention into practical use for many years to come, if at all. The manner in which it was derided and ridiculed by the officers of the Western Union Company, even after it had been in daily use on the Franklin line for more than two years, is well known, and affords an excellent example of this.

In reference to the interference between the patents to which your correspondent alludes, I have only to say that it is a simple question of fact, and can only be decided after a very careful investigation of the whole subject by competent persons. In any event it concerns nobody but the owners of the respective patents, who are doubtless abundantly able to look after their own interests. F. L. P.

Elizabeth, N. J., Jan. 13th, 1874.

Congress and the Telegraph.

WASHINGTON, D. C., January 14.

TO THE EDITOR OF THE TELEGRAPHER.

SINCE the reassembling of Congress telegraph matters have scarcely been thought of either in or out of the Capitol.

The House Committee on Appropriations, to which the subject was referred, have had no time, and apparently little disposition to bother themselves with the matter. It came up, however, yesterday in the Committee, and was postponed until next Tuesday, when it is proposed to dispose of it in one sitting. The sentiment of the Committee is known, however, to be very much opposed to the scheme of buying existing lines, and the proposition contained in Mr. Cresswell's report,

that the Government shall ignore existing telegraph interests and build new lines, to compete with those now in operation, is not regarded seriously by anybody, except possibly by Mr. Cresswell himself.

As has been before stated, there is no prospect of anything being done in regard to telegraph matters at this session. The absence of any popular demand for a Government ownership or management of the telegraphs, would prevent its favorable consideration by Congress, even if other conditions were favorable to it, which is not the case.

Even the Postmaster General has abandoned any expectation of accomplishing anything in the furtherance of his pet project at present, and, from the indications at this time, Congress and the telegraph is likely to prove a barren subject, so far as any special interest is concerned. CAPITOL.

Setting up the Gravity Battery.

TO THE EDITOR OF THE TELEGRAPHER.

IS IT the rule (I do not find it anywhere), in setting up Calland cells, to put all in position, water included, and close on short circuit before supplying sulphate of copper? My observation is that this is the very best way. Circuit being closed, the first trace of acid reaching the zinc causes current, and consequent consumption of sulphate of copper, keeping the strong solution away from zinc, when it is not desired to use sulphate of zinc to start with. S.

[This method of setting up a battery is recommended by most writers on the subject, except that they do not give any specific directions as to whether the circuit is to be closed before or after the sulphate of copper is dropped in. Our correspondent's suggestion is a good one.—ED. TELEGRAPHER.]

Solution of Problem.

TO THE EDITOR OF THE TELEGRAPHER.

I OFFER the following as a solution of B.'s problem on page 3 of THE TELEGRAPHER of January 3d:

Any one of the stations can work simultaneously to the three others, provided the wires are connected at the intersection, by using his own battery, the other stations being connected to ground without battery. According to Ohm's law the current will divide into three parts at E; and, for that reason, the sending station should be supplied with a battery affording a sufficient quantity of electricity. An ordinary sulphate of copper battery, in the above case, would suffice.

The same arrangement should be adopted at each station. When at rest, every station should have the extremity of its branch line connected through its relay with the ground, to be ready for any coming message, and, before sending, the receiving station is called as usual, as they receive all together. An open circuit key, as on European lines, would be advantageous in that case, although not necessary.

GEO. D'INFREVILLE,
Consulting Electrician and Engineer.

TO THE EDITOR OF THE TELEGRAPHER.

"B." ASKS how offices A, B C and D, connected by lines joined at E, may work with each other.

There are two ways.

First. Let him try the old open circuit plan, or what is nearly the same, double pointed keys, front to battery, back to ground, lever to line, without circuit closer.

Second. Let him increase his capital stock and sell enough to pay for wire to build it as it should be, and to also pay two or three semi-annual dividends, after which, when the stock can be bought in at from twenty-five to thirty cents, secure all within reach, then sell a control to the Western Union at fifty cents, and close out the whole concern by lease at four per cent. on the whole capital. PERKINS.

[We have also received solutions to this problem from J. L. W., C. H. H. and R. J. H., which are correct, but the above will be sufficient. Our correspondents have solved this problem apparently with little difficulty].

How the Difficulty of "A Sticking Key" may be Avoided.

NEW YORK, January 6th.

TO THE EDITOR OF THE TELEGRAPHER.

STICKING KEYS are the bugbear of fast telegraphing. I had one that bothered me terribly, and the following simple device saved me all trouble and avoided all difficulty. I inserted a little oil between the platinum points, which is then held in suspension by the attraction of the metal, and does not have to be renewed more than once or twice a month. My key has never stuck since, and I do not think it will, though I work it very close. The oil should be pure; watch oil will do; and, very probably, some other non-conducting substance, such as glycerine, could be used with advantage. E. M. D.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JANUARY 17, 1874.

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A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT
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Consolidation and Telegraphic Competition.

THE absorption of the lines of the Pacific and Atlantic Telegraph Company into the Western Union system, although anticipated for more than a year past, naturally creates some uneasiness on the part of telegraphers and the public as to the permanence and stability of other competing telegraph organizations. It is not to be denied that there is a fear that these may one by one be forced to succumb, and that in the end the assertion, so confidently made by Mr. ORTON in his late report to the stockholders of his company, that at an early day there would be practically no competition in the telegraph business of this country, may prove to have a better basis than has generally been supposed.

We do not regard these fears and anticipations as well founded. The fate of the Pacific and Atlantic Company, from its management, was inevitable, if not actually intended by Mr. THURSTON, its late President, and those associated with him in the actual control of the company. It has long been known that it was in a moribund condition, and that the period of its existence as a telegraph organization was dependent upon the will of its former rival. The only cause for surprise is that it existed so long—not that it has at last been exhibited in its true colors.

As we have before stated, that company is much less damaging to the competing interests in its present condition than it was while dragging out a miserable imppecunious existence. It has removed an obstacle to the progress and enterprise of other companies, which are honestly engaged in maintaining telegraphic competition. It throws open to occupancy an important section of the country, and there is no doubt but that at an early day the routes which it covered will be made available for the establishment of new lines, which it is to be hoped will be managed more efficiently and honestly than those which preceded them. It is essential, however, to the safety and permanence of any telegraphic system competing with the Western Union, that it should be practically one in interest and management. It will not do to continue an attempt at a guerilla contest, and operate in comparatively small and feeble organizations. There is telegraph business enough for two national organizations, and it would be the part of wisdom for the existing telegraph organizations not in the Western Union combination to unite their forces, and act vigorously and effectively for the best interests of all concerned. Until this is done they are liable one by one to meet the fate which has overtaken so many similar organizations, and which has so recently befallen the Pacific and Atlantic Company.

The railroad telegraph system of the country has become of great extent and importance, and it is for the interest of the railroad companies generally that they be enabled to control and operate their own lines. It seems to us that they are deeply concerned in the maintenance of an effective and powerful telegraphic competition. If any telegraphic organization shall succeed in establishing a practical telegraph monopoly, it will not be content until it brings the railroad telegraph lines into subjection to it, either through the notorious PAGE patent or some similar outrageous monopolizing device. The railroad companies of the country should not be compelled to pay tribute to or submit to the exactions of any telegraphic monopoly. It seems to us that they are vitally interested in this matter, and should not be slow to combine their forces with those of a competing organization such as we have indicated. In fact, one or more of the great railroad companies might very properly take the lead in bringing about such a combination and consolidation of the telegraphs and telegraph organizations outside of the Western Union.

The telegraphic field is ripe for this harvest, and to secure it it is only necessary that the proper parties should, without unavoidable delay, proceed to do the work. If this opportunity should be neglected, it is hardly probable that so excellent an one will soon be again presented. Such an organization as might thus be brought about would be national in its character,

and by availing itself of the best telegraphic systems, with the pecuniary resources which it would possess, could maintain itself against any efforts possible to be made against it. Such an extended telegraph system, properly and economically managed, would undoubtedly prove profitable also, and serve the interests of investors, the fraternity and the public alike.

It is evident that there is not the slightest probability of Congress interfering with the telegraphs of the country—it could not if it would in the present condition of the public finances—and past experience has demonstrated that it would not if it could, so long as the public is properly served at reasonable rates—and there is no popular demand that, in addition to its other multifarious duties, the Government shall undertake the telegraph business of the country. As long as there is any effective competition in the telegraph business there will be no popular or general demand for a Government telegraph. The only condition which would create this demand, in our judgment, would be such a telegraph monopoly as Mr. ORTON and his associates in the management of the Western Union Company have labored for years to establish, and which that gentleman assures his stockholders will be established in the near future. We are satisfied that in his case the wish is father to the thought, and that there is yet too much good sense on the part of those intrusted with the management of the competing companies to allow them to go to the wall, when they can so easily be not only preserved but strengthened, and their value and importance increased.

The interests of the public and of the telegraphic fraternity require that there shall be telegraphic competition. It will, indeed, be an unfortunate day for the telegraphers generally when the Western Union or any other telegraph organization, through a monopoly, shall have them at its mercy. The great body of employes of the Western Union Company are to-day benefited by the existence of its competitors. The result to the fraternity of the establishment of a telegraphic monopoly must be too evident to every intelligent telegrapher to require detailed elucidation from us. It is in their interest and in that of the public that we urge such action on the part of managers of existing competing telegraph organizations, and on the part of railroad managers, as shall assure the creation and permanence of a united, powerful and successful competitor of the Western Union Telegraph Company.

The Social and Professional Status of Telegraph Operators in this Country and Europe.

AMERICAN operators, generally, have but little idea of the different social and professional status of practical telegraphers in this country and Europe. Indifferent as many of them regard their position and compensation, they are in every respect in advance of the similar class there. To some extent here a good operator is expected to have some knowledge of electrical science, and to be able in an emergency to assume the management of the wires and business. In Europe a telegraph operator or clerk (as they are termed) is merely an operator, and is expected to know nothing more than how to send and receive messages. The arrangement of circuits, management of batteries, testing, removal of difficulties, etc., are intrusted to officials specially assigned and instructed in such duties, and it would be regarded as presumptuous and absurd for a mere operator to interfere in the higher branches of the business. As a natural sequence to this they are paid proportionately, and the salaries received by them would be scouted by even second rate American operators. They are in fact barely sufficient to enable them to live in a very humble and unpretentious manner—and the discipline in which they are held is of the most stringent and strict character. Their social position is but little, if any, above that of other laborers, and not so good as that of the better class of merchants and storekeepers' clerks and assistants. The business being a Government monopoly, they are compelled to accept such positions and salaries as are offered them, and cannot vary their employment at will, as is the

case here. As an offset to the small amount paid for their services, it must be acknowledged that two or three are employed to do the work that any competent operator is expected to do in this country, so that the advantage peculiarly to the system is not so great as would at first sight appear.

We do not think that the telegraphers in this country would be pleased if placed under similar conditions as to professional and social position, and certainly not as regards the scale of salaries, as their European brethren. They enjoy advantages and have prospects in life which the latter would never dream of, and this ought to be some compensation for the evils of which they not unfrequently complain.

Naturally, in the increase of the telegraph business in extent and importance, the duties have been subdivided to a considerable degree, even in this country, and in the larger offices especially, the operators, as a general thing, are not expected to be as familiar with the whole routine of duties as formerly—but almost every telegraph operator here looks forward to the time when he shall become chief operator and manager, and every manager has in view the higher position of superintendent, and this incites the better class to become acquainted with electrical science to some extent, and its application to practical telegraphy.

Socially, the American telegrapher is as good as anybody else, and it is his or her own fault if they occupy a lower social position than others of the community.

The successful publication of *THE TELEGRAPHER* is an illustration of the different *status* of the American telegraphers from that of any European country. In no other country would it be possible to maintain a publication which should be devoted to the interests and the organ of the telegraph operators themselves. This idea would be regarded as absurd, and not the least so by the operators themselves.

We hope that our telegraphic friends will think of these things, and that they will strive by all means in their power to improve their social and professional *status*. They can do this most effectually by seeking to obtain a more thorough scientific and practical knowledge of their profession. Every telegraph operator who designs to make the business a permanent occupation, should, seek by study and application to become fitted to discharge creditably and satisfactorily any position in the telegraph service. They should not be satisfied with a knowledge of the merely mechanical duties of manipulating a key and reading telegraph signals as they are transmitted. However expert they may be in these, they are but the lower rounds in the professional ladder, and those who would go higher must be content to study and investigate, instead of idling away their time in material pleasures and temporary personal gratification. There is a brilliant telegraphic future before us, and let it be the ambition of one and all that the telegraphic fraternity shall be worthy of the highest respect and honor, and not, as in other countries, mere servants, for whom there is little chance of professional or social elevation.

Impecunious Telegraphers.

Not a few telegraphers, when solicited to subscribe for *THE TELEGRAPHER*, excuse themselves on the ground that they are too poor, and cannot afford the small amount required to secure its weekly visits. There may be a few who make this excuse in good faith, but in most cases it will not bear examination.

How many are there who have made this excuse that do not every month waste in useless or hurtful expenditures more than the subscription price of the paper for a year? If a telegrapher does not desire to receive the paper, or does not consider it of sufficient value to repay the investment, he or she may very properly decline to subscribe for it. We can in such cases only regret their lack of appreciation, but have no reason to question their honesty.

The amount of information and instruction contained in a volume of *THE TELEGRAPHER* makes it of far more

value to any person interested in telegraphy than many times the amount of the subscription price. In fact, we do not think that any such person can really afford to be without it. This is not our opinion alone, by any means. We are almost daily in receipt of letters of the most flattering character, and, if we may credit the statements of our correspondents, *THE TELEGRAPHER* is constantly improving, and becoming more valuable from week to week. We hope that telegraphers will seriously consider whether they can properly and advantageously dispense with the paper, and whether in reality, if it is necessary to economize, economy cannot be better exercised in some other direction. The recent additions to our subscription list indicate that our views in this matter are by no means ours alone. There is still room on our books for many more subscribers, and we hope the good work that has been so excellently commenced will be continued, until every telegrapher who desires to be advanced in the profession, and who especially seeks to become better qualified for the discharge of telegraphic duties, shall be enrolled on its subscription list.

Congress and the Postmaster General.

POSTMASTER GENERAL CRESSWELL evidently is not in favor with the members of Congress. His urgent pleadings with that body to establish a Government telegraph system, and to entrust to his department its control and management, fall on unheeding ears; and now his recommendation to establish a postal savings bank system is understood to meet with no favor in the committee to which it was referred. The transmission of public documents free through the mails is likely to be restored, and the expensive foolery of printing stamps, to be sold to the other Government departments and officials, for use on official communications, instead of their being franked as heretofore, will probably be abandoned. The deficit in the revenues of the Post-office department the last fiscal year was over \$6,000,000, and is increasing, notwithstanding the abolishing of the franking privilege. We are afraid that he will be forced to the conclusion that Congress is a very intractable and altogether obnoxious assemblage, and managing the Post-office affairs of the country a by no means desirable job. However, he can console himself with the idea that if he is inclined to give it up there will be no difficulty in finding a suitable person to take it off his hands, and, possibly, one with fewer crochets in his head and somewhat less ambition may find it easier to get along with.

A Very Pretty Project.

As many of our readers know, the speculation in Western Union Telegraph shares has been very active since the monetary stringency has been relaxed, and the price which, during the panic, was depressed to the neighborhood of fifty, has recently advanced rapidly, and is quoted at 76 to 79, and has even touched 80—some 4,000 shares having been sold at that figure on the Stock Exchange one day last week. This rapid advance has been stimulated by reports that it was intended to declare a large dividend shortly, and that the Executive Committee of the company had the matter under consideration. Last week some parties engaged on the bull side of this speculation got up a petition addressed to the management of the company, which was circulated in the Exchange, proposing that, in addition to the \$7,000,000 of the stock which was held by the company on the first of July last, enough more should be purchased by the company to reduce the Capital stock to \$30,000,000; and that then \$15,000,000 of 7 per cent. income bonds should be created and divided among the stockholders *pro rata*, as representing the net earnings of the company since 1869. This would be in effect preferred stock, and the capital of the company would then be represented by \$30,000,000 of common stock, and \$15,000,000 of these income bonds, or preferred stock, in addition to its other indebtedness. Undoubtedly this would be a very good arrangement for the speculators, and the circulation of

the petition had the immediate effect of advancing the prices of the stock, which was probably all that was designed by the enterprising genius who devised the scheme.

It has not generally been supposed the nominal capital of the Western Union Company required any additional inflation. The plan which was originated by President ORTON, and in the carrying out of which the late HORACE F. CLARK was engaged, was to reduce the capital and bonded debt to \$30,000,000, by investing the net earnings of the company in its own shares until the amount had been thus reduced. This plan, the legality of which at best was exceedingly doubtful, came to grief when Mr. CLARK died, and as is well understood, has been abandoned; but it is not reasonable to suppose that the present managers will not only undo what has been accomplished in that direction, but actually dilute still further the already excessive nominal capital of the company.

It is understood to be the policy of the present managers in the future to distribute in dividends the net earnings of the company, and it is not improbable that a dividend of some as yet undetermined amount will be declared by or before the first of July next.

Watts & Co.'s New Catalogue.

WE have received from WATTS & Co., of Baltimore, a catalogue of telegraph material and electrical apparatus manufactured and sold by them, which is very carefully and handsomely got up. It is illustrated with engravings of nearly all the different articles kept on hand, including several specialties of this firm which have already become widely known. Among these may be mentioned the main line sounder, or "wreck instrument," very useful and convenient in railroad work; keys with Davis' patent circuit closer—an excellent device; a cheap, simple and effective dial instrument, which only costs forty dollars; Scott's patent hotel annunciator, and the well known Baltimore battery. The catalogue will be found of much intrinsic value merely as a book of reference, as it contains all the formulæ and tables for size, weight and resistance of iron and copper wires, and a very full and explicit series of instructions for the use of students and amateurs, in which we think we recognize the handiwork of our old friend, Mr. J. B. YEAKLE, who is now associated with WATTS & Co., and attends principally to the electrical work of the establishment. Copies of the catalogue may be had on application to WATTS & Co., 47 N. Holliday street, Baltimore.

Patent Insulated Telegraph Wires.

THE use of Insulated Telegraph Wires has very largely increased during the last few years, and the quality of such wires has been greatly improved. The new advertisement of Mr. EUGENE F. PHILLIPS, of Providence, R. I., which appears in this number of *THE TELEGRAPHER*, will be found of interest to all who may have occasion to use such wires. The wires manufactured by Mr. PHILLIPS are of a very superior quality, and the demand for them has been so large, and is increasing so rapidly as to require an enlargement of his factory, which is now completed, and in future he will be able to fill all orders promptly and satisfactorily. We have no hesitation in recommending these wires, as we know them to be all that is claimed for them.

Telegraphic Positions on Central and South American Lines.

WE are occasionally in receipt of letters from telegraphers, who desire to obtain situations on telegraph lines in the Central and South American States, asking for information as to rates of compensation, chances of obtaining situations, how to make applications, etc.

From such information as we have of these lines we do not feel at liberty to encourage any telegrapher, who has employment in this country, in seeking to better his fortune by emigrating to those countries, as we understand the rates of compensation of telegraphers there are much less than in this country. The climate is

unhealthy for foreigners, and the mode of living not agreeable to those who have been used to living here.

In no country in the world are telegraph operators so well paid, or as pleasantly situated, notwithstanding the disadvantages which undoubtedly exist, as here;

The "Public Ledger" Almanac.

We have received from Mr. GEORGE W. CHILDS, of Philadelphia, the Public Ledger Almanac for 1874.

Personals.

Mr. GEORGE CLARK, late Train Despatcher on the Pennsylvania Central and St. Louis Railroad at Pittsburg, and formerly of the Philadelphia and Erie Railroad, has been appointed Special Agent for Mr. GEORGE WEBB, Assistant General Manager of the Pennsylvania and St. Louis Railroad.

Messrs. GEORGE H. BOWKER, and M. F. SMITH, have accepted positions with the Atlantic and Pacific Telegraph Company at Albany, N. Y.

Mr. C. E. LAKE, of Poughkeepsie, N. Y., has accepted a situation with the Atlantic and Pacific Telegraph Company at Troy, N. Y.

The Telegraph.

Telegraphic and Electrical Brevities.

THE Atlantic and Pacific Telegraph Company have opened offices at 44 Pine street, 122 Front street, New York City, and 18 Exchange Place, in Jersey City, N. J.

The Atlantic and Pacific Telegraph Company have opened an office in the Delevan House, Albany, N. Y., with Mr. E. A. GAY as operator.

The Atlantic and Pacific and Franklin Companies have secured some of the best offices recently occupied by the Pacific and Atlantic Company in the principal cities where the lines of these companies extended, and opened offices for their lines in them.

The bill before the Legislature of New Zealand, authorizing a cable to Australia, has become a law.

It is suggested that, in the laying of ocean cables, communication between the deep sea line and floating buoys, all along the route, be arranged.

The West India and Panama Telegraph Company.

A MOVEMENT is on foot among the shareholders of the West India and Panama Telegraph Company to call an extraordinary meeting of the company, for the purpose of taking into consideration the report of the committee, and reconstituting the present board.

A more remarkable abuse of the privilege of using proxies has seldom been attempted than that which appears to have been the case at the recent meeting of the shareholders.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each.

For the week ended December 16, 1873, and bearing that date.

No. 145,532—ELECTRO-PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS. William F. Schmoele and Henry Schmoele, Jr., Philadelphia, Pa., assignors of one third their right to Charles Schmoele. Application filed March 7.

A small wind pocket, operated by an electro-magnet, is used as a trip to operate the valve of a wind instrument.

1. The use or application of an electro-magnet to operate a wind pocket or pockets employed to work the valve, substantially as set forth.

2. The form of pocket and valves employed, admitting the wind by a groove with double aperture, controlled by two valves or nuts opposed to each other on a screw threaded wire, substantially as set forth.

3. The small or primary pocket with diminutive valve, to control the large or secondary pocket, which operates the pallet or other resistance, substantially as described and set forth.

THE custodian of many secrets—the telegraph operator.

WANTED.

Wanted to know the whereabouts of ROBERT McCALLUM. Was operating on the B. and M. R. R. when last heard from.

TELEGRAPH POLES.

Parties who are in want of good

CEDAR TELEGRAPH POLES,

can obtain them on favorable terms, and have them delivered at any Lake Port between Oswego and Chicago, on the opening of Navigation, by applying to

A. A. COLBY,

P. O. Box 1,376.

TORONTO, ONTARIO, CANADA.

EUGENE F. PHILLIPS,

MANUFACTURER OF

REED & PHILLIPS'

PATENT INSULATED TELEGRAPH WIRES,

(PATENTED, NOVEMBER 18TH, 1873.)

Lock Box 169.

PROVIDENCE, R. I.

Having recently enlarged our factory, we are now prepared to furnish at short notice any style and quantity of

BRAIDED LINEN or COTTON COVERED WIRE,

saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.

PAINTED, PARAFFINE or SHELLAC WIRES

also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.

We are also prepared to furnish a new style of

ELECTRIC CORDAGE,

which has been pronounced by all superior to any in the market.

The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.

Sample Card and Price List furnished when requested.

Phillips' Wire can be had of

- L. G. TILLOTSON & Co. New York.
CHARLES T. CHESTER. "
F. L. POPE & Co. "
W. HOCKHAUSEN "
PATRICK BUNNELL & Co. Philadelphia.
WATTS & Co. Baltimore.
CHARLES WILLIAMS, JR. Boston.
THOMAS HALL "
GEORGE H. BLISS & Co. Chicago.

General Superintendent's Office, AMERICAN DISTRICT TELEGRAPH CO., NEW YORK, January 1st, 1874.

E. F. PHILLIPS, Esq.

Dear Sir: Your office wire is a decided success. We have used it exclusively for two years and consider it the best in the market.

Respectfully,

W. H. SAWYER, Gen'l Sup't.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

No. 220 KINZIE STREET, CHICAGO.

TELEGRAPH, WIRES, INSTRUMENTS,

BATTERIES, TOOLS,

INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND

UNION BRAND EXTRA QUALITY.

JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS.

KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

Western Electric M'f'g Co., Chicago.

JEROME REDDING & CO.,

30 HANOVER STREET, BOSTON,

MANUFACTURERS AND DEALERS IN

Electrical and Telegraph Instruments.

A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,

INSULATORS, BRACKETS.

PATENT ELECTRIC WATCH-CLOCK

THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection

MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS, AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

PANIC PRICES.

OUR PROFITS HAVING BEEN AMPLE,

WE OFFER OUR CUSTOMERS THE BENEFITS OF THE RECENT REDUCTION

IN THE COST OF LABOR AND MATERIAL.

ALL WHO NEED

TELEGRAPH INSTRUMENTS and SUPPLIES,

IN

Large or Small Quantities,

WILL CONSULT THEIR OWN INTERESTS BY PURCHASING FROM US.

SEND FOR OUR NEW PRICE LIST.

A Special Discount given on Cash Purchases.

GEO. H BLISS & CO.,

41 THIRD AVENUE,

Chicago, Ill.

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CHICAGO, ILL.

TELEGRAPHIC, ELECTRICAL AND MEDICAL APPARATUS.

Agents for KIDDER'S MEDICAL APPARATUS.

- " " AMERICAN COMPOUND WIRE.
- " " JONES' LOCK SWITCH BOARD.
- " " ROBERTSON'S BATTERY INSULATOR.
- " " HILL'S GRAVITY BATTERY.
- " " HILL'S HOTEL ANNUNCIATOR and FIRE ALARM.
- " " McPHERSON'S IRON BATTERY.
- " " THE AMATEUR TELEGRAPH APPARATUS.
- " " PUTT'S MECHANICAL INSTRUMENTS.
- " " KENOSHA INSULATOR.
- " " BROOKS' "
- " " UNITED STATES ELECTRIC GAS LIGHTING COMPANY.
- " " POPE'S RAILWAY SIGNALS.
- " " EAGLES METALLIC (RESERVOIR) BATTERY.
- " " SELDEN'S PRINTERS.
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IMPROVED AMATEUR SOUNDERS.

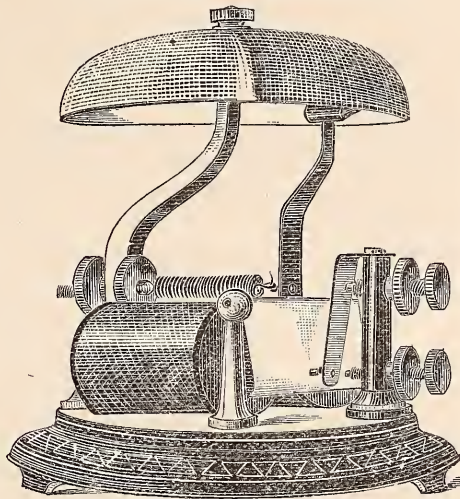
- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3.....\$4 00
- A WELL FINISHED AND GOOD WORKING SOUNDER, No. 4..... 3 00
- A WELL FINISHED AND GOOD WORKING KEY, No. 4. 4 00

Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

Special attention given to REPAIRS and MODEL WORK.

W. HOCHHAUSEN,
Manufacturer of
ELECTRICAL INSTRUMENTS,

132 WILLIAM STREET (rear),
Between Fulton and John Streets, NEW YORK.



One half of actual size

ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

- The Platina Points are large and hard.
- Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00
- Sounders, from..... 4 50 to \$6 50
- Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00
- Relays, from..... 9 50 to 16 00
- Improved Switch Keys, from..... 3 00 to 5 50

Send for Illustrated Circulars.
The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

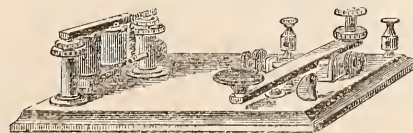
LECLANCHÉ BATTERIES.
CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY CO.,
No. 40 West 18th Street.

New York, October 11, 1873

TILLOTSON'S EXCELSIOR TELEGRAPH INSTRUMENT.



(PATENTED JUNE 24, 1873.)

This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.

- Price, complete, Sounder and Key mounted on finely finished Mahogany Base, with one Cell Hill's Patent Battery, with Chemicals, eight feet of Office Wire, and "Smith's Manual of Telegraphy".....\$7 50
- Two sets..... 14 50
- Price of Sounder and Key only..... 6 50
- " " " with Cut Out and Lightning Arrester attached..... 7 50

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L. G. TILLOTSON & CO.,
No. 8 DEY STREET, N. Y.

THE BEST TELEGRAPH MATERIAL IN THE WORLD

IS SUPPLIED BY

L. G. TILLOTSON & CO.,

8 Dey Street, New York,

MANUFACTURERS, DEALERS and IMPORTERS

OF

TELEGRAPH MACHINERY, SUPPLIES

AND

Line Equipment of every Description

MATERIAL AND INSTRUMENTS

always on hand, for the equipment of lines of any length, at a moment's notice.

We furnish first class goods at low prices. Liberal arrangements made with Superintendents, Contractors and Builders of Telegraph Lines.

- Registers..... \$38 00 to \$45 00
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RATTLE TELEGRAPH SOUNDER, \$3.50.

POCKET INSTRUMENTS, Nickel Plated, in Hard Rubber Cases, 1½x2x5 inches.

CUT-OUTS, Plug, Peg or Button, with or without Lightning Arresters, for one, two or more Lines.

JONES' PATENT LOCK SWITCHES, the best and cheapest in use, with or without Lightning Arresters.

PEG or PIN, CULGAN, REPEATING, GROUND, LOCAL, BATTERY and SINGLE BUTTON SWITCHES.

LIGHTNING ARRESTERS for any number of wires, of most approved patterns.

ELECTRO-MAGNETS,
PERMANENT MAGNETS,
APPARATUS for STUDENTS and AMATEUR TELEGRAPHERS
ELECTRIC MOTORS,
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ELECTRICAL ANNUNCIATORS,
FIRE and BURGLAR ALARMS,
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RHUMKORFF COILS, from ¼ to 10 inch spark.

GEISSLER'S TUBES, from \$1.00 upwards
ELECTRICAL CALL AND ALARM BELLS in great variety, from \$6.50 upward.

INSTRUMENTS furnished Nickel Plated at 20 per cent. advance on List Price.

OFFICE WIRES, from 80c. to \$1.25 per pound.

GUTTA-PERCHA COVERED WIRES, all sizes.

BISHOP'S NEW COMPOUND COVERED WIRE, for running into offices, 4c. per foot.

MAGNET WIRES, in Silk and Cotton, at Factory prices.

INSULATED WIRES for special purposes made to order.

SILK COVERED SWITCH CORD, one, two or more conductors.

PATENT MESSAGE HOOKS, the best ever introduced, prices 65c. and 75c. per dozen.

MANIFOLD PAPER and AGATE STYLUS at bottom prices.

CABLES AND SUBMARINE WIRES.

REPAIRERS' TOOLS and TOOL BAGS.

GLASS AND RUBBER WINDOW TUBES.

KENOSHA AND OTHER INSULATORS OF EVERY DESCRIPTION.

BRACKETS, PINS AND SPIKES.

HILL, CALLAUD, GROVE, BUNSEN, CARBON, DANIELLS,

LECLANCHÉ, NITRO-CHROMIC AND OTHER

STYLES OF BATTERY IN ANY

QUANTITIES.

PURE CHEMICALS AT LOWEST PRICES.

SULPHATE OF COPPER A SPECIALTY, AND PRICES VERY LOW.

CARBON PLATES made to order for Grenil, Smee, Stohrer and other Batteries.

OFFICE FIXTURES and BATTERY UTENSILS OF EVERY DESCRIPTION.

"Smith's Manual of Telegraphy," - - - 30 cents.

ALL STANDARD WORKS on ELECTRICITY & TELEGRAPHY.

SOLE AGENTS FOR

RICHARD JOHNSON & NEPHEW'S CELEBRATED LINE WIRE.

Catalogue and Price List furnished upon application.

L. G. TILLOTSON & CO.,

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A MERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,
General Agent and Superintendent.

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ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,
Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
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Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
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St. John, N. B.,
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Savannah, Ga.,
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Taunton, Mass.,
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The Distinctive Features of these Systems of

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ARE,

First—The **Automatic Repeater**, through which the
apparatus may be distributed in a combination of circuits, and
the entire system successfully worked, without the constant per-
sonal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**,
adapted to produce the full tone of the largest church or tower
bells.

Fourth—The **Electro-Mechanical Gong Striker**,
for home and engine houses, by means of which the location of
the fire is instantaneously communicated to the members of
each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by
the Proprietors of these systems of

FIRE ALARM

AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of
practical use, and that the efforts which have been repeatedly
made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to
adopt other systems having demonstrated their insufficiency
and unreliability, and resulted in their abandonment, and sub-
stitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the
original *FARMER & CHANNING PATENTS*, one of the most
important of which has just been extended for seven years, and
during the past seventeen years have spared no expense or effort
to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have
adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little ex-
pense, compared to the benefit which it confers, that even small
communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of
the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POS-
SIBLE IMPROVEMENT which shall increase the

EFFICIENCY,
RELIABILITY and
ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruc-
tion, and the number of lives which have been preserved
through the general adoption of this system, throughout the
UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for
any considerable length of time, they have been enormous, **THREE**
CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its in-
troduction into their localities is cordially invited, and
their efforts will be duly appreciated and
compensated.

Any information desired in regard to the above
system will be cheerfully and promptly furnished
upon application at the office.

A pamphlet, setting forth more fully its advantages and
superiority, has been printed, and will be supplied to Municipal
Authorities and others interested in Fire Alarm and Police Tele-
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CHARLES T. CHESTER,

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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at
\$120 and \$135 a set, consisting of two Relays, two Sounders, two
Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-
locked connection between any number of wires, occupying for
each different connection only one square inch of space, and
though made of the largest size, not subject to the warp and
contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three
years, an Insulated Wire which can be buried in the earth or
exposed to rain and sun, or to the vapor of acids, without injury.
Professor SILLIMAN, who has exposed it to the most destructive
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ozone, which would destroy gutta-percha in a few hours. It
exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article
for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will
exceed, in insulation for submarine purposes, ANYTHING
HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and
size of cable, which will be found to compete with any other
construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**,
with Patent **Platina Connection**, introduced by us eight years
since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**,
now extensively used in this and other cities for private lines,
being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that
will work practically with a single **DANIELL** cell, a **BATTERY**
that does not require to be taken down but once a year, and the
very best **MAIN LINE SOUNDERS** made

Our **CATALOGUE**, embracing a large amount of new matter
and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH
INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
 22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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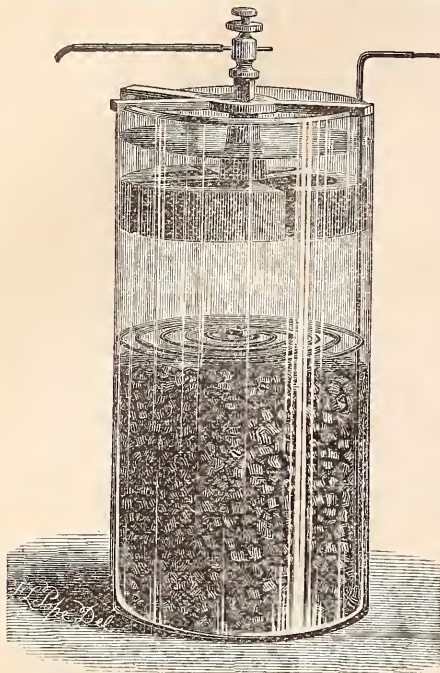
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Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1/800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1/150th to the 1/300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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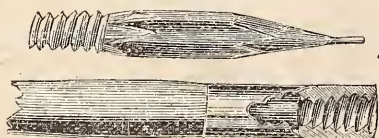
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This HOLDER is intended to save the last half or third of the pencil.

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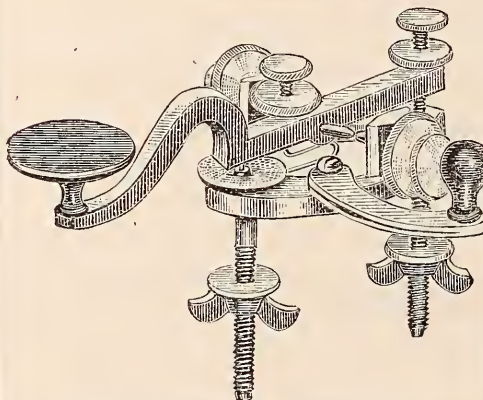
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Which has met with marked success.



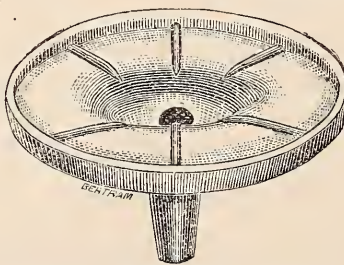
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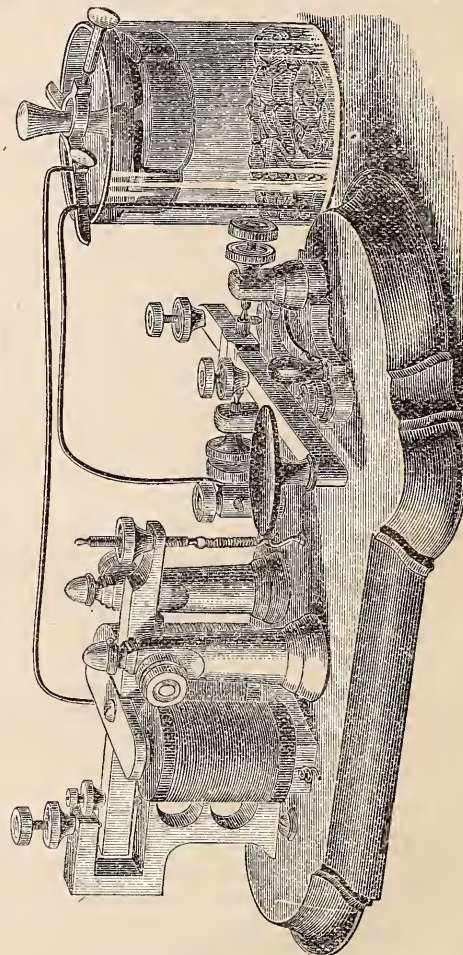
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A Journal of Electrical Progress



Vol. X.

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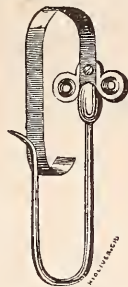
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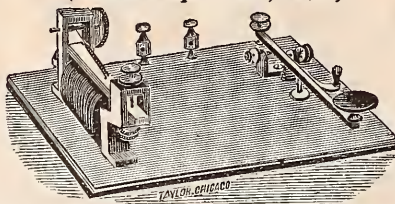
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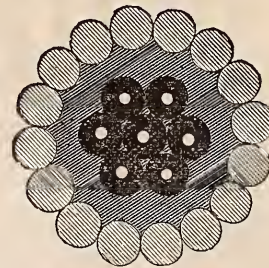
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

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Dedication of the New General Post-office, London.

THE London newspapers of the 2d instant contain very full reports of the dedication of the new General Post-office, which occurred on New Year's night, and which seems to have been quite a brilliant affair. The following is condensed from the report published in the *London Times*:

"Last evening this edifice, erected in St. Martin's-Grand, immediately in front of the old General Post-office, and which has been devised and constructed with a careful regard to the large and still growing wants of postal communication, as understood in the present day, and especially telegraphic communication, may be said to have been dedicated to the public service. The ceremony of last night assumed the modest form of a *conversazione* in commemoration of the reopening of the Post-office Library, and a large and influential company, some hundreds in number, many of whom were ladies, had been invited to witness it, the new Postmaster General, Mr. Lyon Playfair, M. P., taking the leading part, as became his official position, and the central, northeast, and southeast galleries of the building having been thrown open for their accommodation. All the heads of departments in the General Post-office were also present, and vied with each other in consulting the comfort and convenience of the audience.

In the southwest gallery, which was brilliantly lighted and tastefully decorated with banners lent for the occasion by many of the civic companies, there was a museum of early telegraphic instruments and appliances. The mode of transmitting news to and receiving it from nineteen large towns simultaneously was also shown there. The system of the Exchange Telegraph Company, by means of which identical information as to the prices of stocks, shares, etc., is sent to the offices of stock brokers, was likewise exhibited. There was a direct communication during the evening between this gallery and the postal telegraph offices in Dublin, Edinburgh, Glasgow, Jersey, Penzance, Manchester, Southampton, and several London stations. In the same gallery, too, communication by means of the Hughes type printing instrument was established between London and Southampton, and messages printed in Roman type were sent simultaneously in opposite directions on one wire, through the instrumentality of Mr. Stearns' invention. The chronofor, by means of which Greenwich time is transmitted simultaneously to the principal towns in the kingdom, was also exemplified there. In the northwest gallery the process of 'testing for faults' was shown. There was direct communication during the evening between this gallery and Australia, India, Teheran, America, St. Petersburg, Paris and Berlin. On tables, microscopes, stereoscopes, graphoscopes and electrical apparatus of various kinds were exhibited, as was also the working of the pneumatic tubes which connect the Central Telegraph Station with the principal offices for the collection and delivery of messages in the metropolis.

A raised dais had been erected in the central gallery, and from it, after the company had assembled, Mr. Lyon Playfair opened the proceedings by delivering an address. He said: 'We are met to-night in the new great telegraphic room which, in a few days, will be the active centre of the whole kingdom for sending out with the speed of lightning and by the same agency the thoughts of people who require immediate inter-communication. All our improvements of postal communication become dwarfed by this mighty invention. Most of you are much more familiar with postal history than myself, but still let us recall to our memory one or two facts, which may serve to impress us with our present position. You all recollect that post messengers arose out of State necessities, and that their survivals are still seen in the Queen's messengers of the present day. They were originally men who travelled on foot or on horse with State despatches, but did nothing for the service of the general public. As they grew more numerous they required a supervisor, who was the ancestor of the Postmaster General. The Universities were among the first bodies who established running postmen of their own to carry the communications of professors and students. Some towns, also, had their own separate postmen. The far north City of Aberdeen, during the reign of Elizabeth, had

the bravery to appoint a postman with a blue cloth dress, emblazoned with the city arms, to go leisurely up to London with the letters of the enterprising Aberdeens, and to bring back those addressed to them. Intercommunication with Scotland was very imperfect until the Scotch King James VI sat upon the English throne as James I. Recollect how he learnt the death of Elizabeth, and the difference between his time and our own will be very apparent. It is related that Robert Carey, having received a ring taken off the Queen's finger when she died, at three o'clock on Thursday morning, galloped off to Edinburgh, which he reached in the middle of the Saturday night. That was a wonderful feat in those days; but now such a message, put into the hands of Mr. Scudamore, would find its way to Edinburgh in less time than Carey could have saddled his first horse. The electric agency which is to be used in this room for sending messages has been known since the world began. Every flash of lightning in the sky revealed its existence. When the savage African rubs his furkaron electric sparks appear, but they light up an eye as intellectually dull as the eye of an ox, and no science is developed from such untutored observations. The clever wife of an Italian physician was the first who noticed a fact which led to our possession of electricity in quantity sufficient for our present purposes. Madame Galvani was the daughter of the celebrated physician, Galeazzi, and she observed that frogs' legs became convulsed under electrical excitement—the popular version being while she was making soup for her husband, but the truer version, that they were convulsed while near an electric machine. Out of her acute observation her husband ultimately discovered the galvanic battery and laid the foundation for telegraphy. But great discoveries do not startle an astonished world by a sudden apparition. It is only in mythology that Minerva, full grown and panoplied in complete armor, starts out of the brain of Jupiter. Science and its practical applications are of slow growth; the seed being put in favorable ground the young plant appears after a time, but requires much care before it comes to maturity. And so Galvani's discovery, supplemented by many intermediate discoveries, required nearly a century to mature it before my friend Sir Charles Wheatstone, whose presence we expect to-night, gave us that form of telegraph which now bridges over space and time from this office to the whole kingdom.

This is not the occasion to give you a scientific lecture, but I would ask you to remember how slowly this Post-office has received its wonderful organization. The inventive genius of Wheatstone, and the bold conceptions of Rowland Hill have aided us powerfully to attain our present position, but both of these men, whose friendship I am proud to claim, would tell you that after all they were mainly exponents of a knowledge which had descended to them by inheritance from their forefathers. Wheatstone could not have achieved his triumphs if Oersted, and Faraday, and many other philosophers had not largely developed the original discovery of Galvani. Rowland Hill could have done nothing in introducing or in carrying into effect the penny post, had there not been large developments in the means of intercommunication, by good roads, coaches and railways. Withering, by his postal organization of 1635; Palmer's mail coach system of 1784; Dockwra, by his London penny post, and Stephenson by his railways, were as much the postal progenitors of Rowland Hill as Galvani, Oersted and Faraday were the scientific forerunners of Wheatstone.

* * * * *

In this great establishment there are many men of thoughtful minds who desire to benefit by the accumulated intelligence of those who have preceded them. They can only acquire this through books. There are few men worked more hardly than our officers; but the nature of the service gives intervals of leisure without which the work could not be performed. In those intervals access to a library and a reading room is of great importance to them, and a lending library to the numerous clerks, both male and female, of this office, offers resources which cannot be too highly valued, either intellectually or morally. I do not intend to weary you with empty platitudes as to the benefits of knowledge. Our work here is of the most varied character. Our postal system, our packet service, our telegraphs, our money order office, and our savings banks—all involve even technical knowledge of geography, science and political economy, which would give ample scope to those who wish to carry on their duties, not by a mere blind empiricism, but with that intellectual understanding which distinguishes man from a mere machine in activity. But we do not desire to confine readers to mere technical books bearing on their occupations. You have the glorious records and learning of antiquity, the literature of more modern times, and the recreative books which amuse as well as instruct. The library is created by yourselves and managed by yourselves, so that it will be adapted for your several needs and desires. I am only here among you to-night by your own favor to wish you continued

prosperity in an undertaking which gets fresh life by the enlarged accommodation afforded to it in a new building. I offer to it no patronage, for that would be unworthy of its object and of the committee who manage it; but I ask you to accept my warmest wishes for the prosperity of the new reading room and library, and to assure you that, while I remain in office the Committee of Management will always find in me a warm friend.'

The address of the Postmaster General throughout was listened to with marked attention, and at its conclusion the company signified their interest and approval by an enthusiastic cheer.

The company then, on the invitation of the Postmaster General, and accompanied by Mr. Scudamore, C. B., and other of the principal officers of the department, made a tour of the several galleries, inspecting the various objects of interest, and had opportunities of witnessing the telegraphic arrangements and operations. The occasion was rendered still more agreeable by a choice selection of vocal and instrumental music. Altogether, the occasion was replete with interest, and the company lingered in the building until far towards midnight."

[From the *Telegraphic Journal*.]

Method of Determining the Actual Resistance of Old Telegraph Line Wires.

To the Editor of the *Telegraphic Journal*.

SIR—In your journal of the 15th inst. I am accused, by J. W. Hagers, Inspector of the Government Telegraphs in the Netherlands, of reproducing a formula of his and publishing it as my own.

The article, "Method of Determining the Actual Resistance of Old Telegraph Line Wires," published in your journal of 15th May, is not written by me, nor is my name mentioned in connection with the article.

I am referred in Mr. Hager's note to an article by Mr. Ayrton, in the journal of the 1st inst. Mr. Ayrton's note had escaped my notice until now.

I desire to say to Mr. Ayrton that the object of my article on "Economical Line Construction," was to show the advantages of perfect insulation, or insulation that is not affected by dampness. In this case a heavy and expensive conducting wire is not essential.

My business is the manufacture of insulators. I guarantee their performance. One of these guarantees is that they shall not be affected by rain or damp weather. I undertake to insulate a wire weighing, say two hundred pounds per mile, and thereby make the capacity of that wire equal to another wire weighing four hundred pounds per mile; this latter wire being insulated with common insulators—such, for instance, as are used in the British East Indies, the Netherlands, or England. I do it and maintain this degree of insulation for a moderate charge—less than is usually expended for such purposes, asking no pay unless these conditions are fulfilled.

To Mr. Ayrton I beg to say I have not had the good fortune to read "Instructions for Testing Overland Lines," compiled by Mr. Schwendler, nor "The Instructions for Testing Telegraph Lines, and the Technical Arrangements in Offices." I have no doubt that I would be interested and profited by doing so.

I and others in this country have applied Mr. Schwendler's formula to correct the apparent or observed resistance of old telegraph lines. I refer to the formula as published by Clark and Sabine. We have been unsuccessful, however, in getting at anything like an approximation to its actual resistance for these reasons: (1.) The resistance of the insulators is seldom if ever uniform for the entire length of line, but constantly changing. (2.) Conductivity of old wires is more reduced by bad joints than by loss of actual weight of metal. The resistance of defective joints is reduced by dampness, in some instances sufficient to make a difference in the apparent resistance of the wire of more than one hundred per cent.

In measuring the resistance of old wires to determine the loss in conductivity from use and exposure, it is perfectly useless to attempt it except in clear or cold weather. In one instance the resistance of an old wire reinsulated was reduced over three hundred per cent. by rain, as compared to a measurement in clear weather. In dry weather in this country the resistance of the insulators is too great to enter into or affect the result. It is beyond the scope or range of the Siemens's universal galvanometer. *It is so in rain* where my insulation is used. Rain or dampness does not affect this insulation. We can then observe and realize the effect of dampness upon the bad joints.

My knowledge of the telegraphs in the British East Indies is derived chiefly from the London journals. If there is improvement I am glad to hear of it. I have, in my business of reinsulating telegraph lines, distributed over thirty of Siemens's universal galvanometers, nearly all of them to railway companies. In the manufacture of these insulators I employ the most sensitive galvanometers, using those made especially for the purpose by Ruhmkorff, Dr. Werner Siemens and Mr. Becker. If we do not keep pace "in the application

of scientific laws to practical questions," we are determined not to be so far behind the rest of the world as to lose sight of those that win the race. I am, etc.,
DAVID BROOKS.

The Postmaster General's Report.

THE annual report of the Postmaster General has been very extensively circulated, and has deservedly attracted considerable attention. The evils which attend our present system, and which we have frequently pointed out, seem at last to have received some consideration, but to any intelligent person that has had much experience in transmitting matters by mail, it is very evident that Mr. Creswell's ideas in regard to the best method of removing the defects which are now a subject of general complaint are by no means clear and practical. And we would earnestly suggest to him that a thorough revision and reform in the practical workings of our present postal operations is far more necessary than any advance in the direction of postal savings banks or postal telegraphs. "One thing at a time" is a good rule, and if Mr. Creswell will only devote his energies to the perfecting of our present system of sending letters, papers, books, etc., he will not only find his time and talents fully occupied, but if he succeeds in giving satisfaction to the reasonable portion of the community, he will have achieved a title to the gratitude of every man and woman in the country, and this is more than he can hope to attain even by his pet scheme of a Government telegraph.—*Industrial Monthly.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., January 12.

TO THE EDITOR OF THE TELEGRAPHER.

THE inevitable scheme of Mr. Gardner G. Hubbard, which has been before Congress for several years, has come to the surface once more. This scheme, as the readers of THE TELEGRAPHER are aware, proposes that a Postal Telegraph Company, so called, shall be chartered by Congress, and be worked in connection with the Post-office Department. It is a scheme to establish a gigantic telegraph monopoly for the benefit of the proposed corporation, under the auspices of and fostered by the Government. It is neither a private enterprise, relying upon its patronage for its profit, or a Government institution, the benefits of which are to inure to the public, although it will be maintained largely at the expense of the Treasury. The Postmaster General does not favor this proposed enterprise, but desires, if any change be made, that a *bona fide* Government telegraph shall be established.

The bill was reintroduced by Senator Ramsay in the Senate early in the session, as has already been stated in this correspondence, and referred to the Post-office Committee, of which he is Chairman. It is similar to the bills which have heretofore been introduced in previous Congresses, and offers no new features of importance.

On Thursday and Friday of last week the committee had the subject before them, and Mr. Hubbard was afforded an opportunity to repeat his oft told tale, and restate his arguments in favor of his pet project, which are now quite threadbare from such frequent repetitions. The scheme has all the disadvantages of the Government telegraph schemes, and none which will compensate for such an extraordinary grant from Congress.

President Orton and Mr. George B. Prescott, electrician of the Western Union Telegraph Company, were also before the committee in opposition to the scheme, and are to be heard further in opposition to it this week.

Mr. T. T. Eckert, of the Western Union New York office, also put in an appearance here on Monday night.

Large numbers of the pamphlets, containing Mr. Orton's reply to the report of the Postmaster General, have been circulated among the members of Congress and others here.

In reply to a resolution of the House, the Postmaster General has prepared a statement in regard to the additional numbers of employés of the Post-office Department which would be required in case the telegraph was added to the other business of the department. His statement is too long to be included in full in this letter, but, in conclusion, he reaffirms the estimates given in his report of 1872, that an aggregate telegraph force of 7,500, including all grades, at an annual cost of \$4,500,000, would be ample to work

the postal telegraph up to 30,000,000 of messages per annum, which, he says, is about double the number transmitted by all the companies operated one year ago.

If our Postmaster General is great in anything it is in statistics. It may be said for him that, having once made his statistics, no amount of demonstration will induce him to retract or vary them. The baselessness and unreliability of his telegraph statistics have been repeatedly and conclusively shown, but he still adheres to and repeats them with a confidence which, if not convincing, is, at least, courageous and obstinate, and is only paralleled by Mr. Hubbard's persistent urging of his scheme for a telegraph monopoly sanctioned by Congress and largely supported by the public treasury.

If Mr. Creswell could reduce the deficiency of six to seven millions in the postal business of the country, Congress and the people might, perhaps, have more confidence in his statistics, and his ability to conduct the telegraph business successfully and satisfactorily. But so long as this deficit annually increases under his administration, they will, on economical grounds, hesitate to confide to him additional business, the cost of which he so greatly underestimates. An effort will be made to have a special committee appointed in each House to take charge of the postal telegraph matter, although the most sanguine friends of the scheme concede that there isn't the ghost of a chance for it this session. The new representatives appear to take more interest in the matter than the older members, and some of them have commenced to cram, to display their intimacy with the subject for the enlightenment of their fellow members and the country when the opportunity is afforded.

A bill was introduced in the House yesterday by Mr. Negley, of Pennsylvania, "to promote telegraphic communication with foreign countries." This bill provides for the incorporation of the Submarine Cable Printing Telegraph Company, which is said to be composed of Boston and New York capitalists, to lay and operate one or more lines of Atlantic cable. The enterprise is based upon new methods of ocean telegraphing—the invention of Mr. W. S. Sawyer, of this city, who was formerly a correspondent here of several newspapers. The promoters of this enterprise are confident that Mr. Sawyer has made an important and valuable invention, which will greatly increase the rate of transmission of telegraphic signals over long cable lines. Section 4 of the act provides "That the tolls for governmental, commercial and private messages over the line or lines of the said company shall not exceed fifty cents per word, and for press despatches shall not exceed twenty-five cents per word."

The weather reports of the Signal Bureau, which were formerly sent over the Pacific and Atlantic lines, are now forwarded by the Western Union, and it is said that arrangements have been concluded between the Signal Bureau and the Western Union Company under which the latter is to resume the service in full, as was the case originally. CAPITOL.

Quantity and Intensity.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE read Mr. Pope's introductory article with interest and profit, and am especially pleased with his happy illustration of the term *potential*. Pardon me, but I do not quite see the drift of his assertion that the electric current cannot be distinguished by the terms "quantity" and "intensity." I am no expert in these matters, and ask only for information. Suppose we have three cells of precisely the same electro-motive force. How are we to distinguish the currents in the two methods of connection, viz., in a single series, or with all the zines joined to one pole and all the carbons to another? G.

Reply.—One objection to the use of the terms "quantity" and "intensity" is, that they have not a well understood and well defined meaning. It is customary to speak of quantity and intensity currents, but a so-called quantity current must have some degree of intensity, and an intensity current must also have more or less quantity. Then we have all shades of currents between the two extremes of quantity and intensity, and nobody can agree what to call them. In fact, the use of these terms for so many years has involved the whole subject in such confusion and obscurity, that I doubt if anybody ever clearly understood it until they had first got rid of the idea inevitably suggested by them, viz., that there are two kinds of electro-currents, of very different qualities and producing very different effects. But when we have once grasped the idea that there is only one kind of current, which, as I have before said, is a current of greater or less quantity—meaning by this that a greater or less amount of electricity passes through the circuit per second—our difficulties and perplexities vanish.

Suppose we take four carbon cells, such as our correspondent speaks of, and connect them to an electro-magnet, first "for quantity" and then "for intensity"—or, as I should term it, first parallel and then in series—and see what the result will be. We will try

it first with an electro-magnet having a resistance of 4 ohms, and let the cells have an internal resistance of 1 ohm each. Connecting them parallel, we have a total electro-motive force equal to one cell only, or say 1.75 volts. The resistance of 4 cells connected parallel is only one fourth that of a single cell, or 0.25 ohms; add to this the resistance of the magnet, and the total resistance in circuit is 4.25 ohms. Therefore, 1.75 (volts) divided by 4.25 (ohms) gives us a current of 0.41 (farads per second).

Now connect them in series and we have $1.75 \times 4 = 6$ (volts), which, divided by $4 \times 1 = 4$ (battery resistance) + 4 (magnet resistance) = 8, gives us a quotient of 0.75 (farads per second), nearly twice as much current as in the first case, showing that for the particular magnet in question we get the best result by connecting in series.

Now take another magnet having a resistance of 0.5 ohms. Connected parallel the current would be 1.75 (volts) divided by 0.75 (ohms), or 2.3 (farads per second). Connected in series we would have 6 (volts) divided by 4.5 (ohms), or only 1.3 (farads per second). Thus the effective force of any current may be precisely determined without the least vagueness. Thus we find that the difference between a current of 100 cells, connected parallel with a very short exterior circuit, and that of the same in series with 500 miles of telegraph wire in circuit, is merely one of degree, and not of kind or quality. F. L. P.

Elizabeth, N. J., Jan. 20, 1874.

Indifference of Telegraph Operators to their own Interests.

TO THE EDITOR OF THE TELEGRAPHER.

THE TELEGRAPHER seems to be working earnestly for the elevation of the profession. I wish you success, but must confess it appears to be almost a hopeless undertaking. The field for such labor is large, but it seems to be almost like "casting pearls before swine."

On a railroad division upon which there are twenty-five telegraph offices, I have personally solicited subscriptions for THE TELEGRAPHER at each office, and obtained four. In three city offices, in places of 4,000 to 8,000 inhabitants, I was even less successful!—obtaining none. Two years ago many of these operators knew nothing of THE TELEGRAPHER, but I think I obtained two subscribers, last year three or four, and this year, after circulating nearly all my numbers of Vol. IX, I obtained four subscribers.

The following scene will illustrate the discouraging indifference and evasions which are encountered by those who appreciate the value of the paper, and desire to benefit telegraphers by inducing them to take and read it:

Scene: A Telegraph office.—Operator wearing silk hat, which cost \$6; brilliant neck-tie, \$1.25, etc. Salary \$40 dollars per month. Enter solicitor for subscriptions to THE TELEGRAPHER.

Solicitor. "Have you read the papers I sent you?"

Operator. "Oh, yes! Read most of them."

Solicitor. "Where are they? I want to preserve them."

Operator looks around and finds one behind the ticket case; another, which has fallen down behind the safe, and thinks he must have used the other to kindle the fire.

Solicitor. "Well, I suppose you will subscribe for the coming year?"

Operator. "No, I can't do it! Two dollars is too much for that kind of a paper. Times are too hard now. My pay is not very much, and, besides, am owing for a box of segars!"

Another, who has two students at present, and from whose office have graduated six *first class* (?) operators within the past two years, all now holding *responsible positions*, at salaries of from \$35 to \$50 per month. Enter agent, to solicit subscription to THE TELEGRAPHER.

Operator. "O, we get that regular; they send it to us; we don't have to pay for that, we don't."

Solicitor explains to best of his ability the difference between THE TELEGRAPHER and the *Journal*—that the object of the latter is to circulate W. U. Tariff circulars, corrections, etc., but that THE TELEGRAPHER is the organ of the fraternity in general; only one in the world with a large fund of scientific and general telegraphic information, chiefly devoted to elevating the profession, etc., etc.

Operator. "Oh, we don't care anything about that; we get the *Journal*, that's good enough for us. We ain't going to pay for a paper when we are getting one of same kind dead head!"

Another, whose orders I have to obey, although he makes me many miles of travel and weary hours of work during a heavy rain, on a glass insulated line of 100 miles, because he got a slight current, with key open at the further end, and did not see how there could be any escape, unless insulators were broken, or trees or limbs on wire; and when I suggested replac-

ing the old Bradley relay (resistance from 300 to 600 ohms), with uniform style, say 150 ohms, didn't see what difference it made; an instrument was an instrument, any way; if they would answer calls, it was all he wanted—when solicited to subscribe, says, "It don't amount to shucks! I wouldn't read it if you would give it to me. Some high toned stuff cant, nobody understands, and rest damn nonsense," etc.

Another, who has a short line from his office to the room of a *Telegraph Institute*, with a capacity of about ten plugs per month, when solicited, says, "O yes; I want that paper, that is a pretty good thing; I am going to have that paper; but, by George, I ain't prepared to send just now. What is the address?" Copies address, saying, "I am going to send for that just as soon as I can." He did the same last year, and probably will as often as asked, never intending to subscribe.

Now, what can be done to elevate such telegraphers as these? I have but little faith in their elevation. If there is such a thing as total depravity, I think they have not far to get there. T.

The Transmission of the President's Message.

AUDUBON, MINN., Jan. 14.

TO THE EDITOR OF THE TELEGRAPHER.

It is claimed that the following statement—

"QUICK TELEGRAPHING.—The President's message, Spanish protocol and synopsis of the Treasury report, in all 12,325 words, were, on the 2d inst., transmitted from Washington, D. C., to New York, over eight wires, by the Western Union Telegraph Company, in one hour. This is the shortest time in which the message was ever received, and under the disadvantage of unfavorable weather—a steady rain falling at the time along the whole length of the lines. The report passed through the Associated Press office in one hour and twenty minutes"—refers to transmission by the Automatic system. I claim that it was sent by the Morse system, making 26 words per minute for each wire—it being transmitted at the same time over eight different wires. Will you inform us through THE TELEGRAPHER which is right? TEN.

[You are right. The despatch referred to was transmitted by the Morse. The Western Union Company do not operate the Automatic system—which President Orton states, as he formerly did in regard to the Duplex, to be inferior to the Morse, as regards speed, and practically valueless. He will, doubtless, in process of time see his error, and retract his present assertions as completely as he already has done in regard to the latter, which, in his last annual report to the stockholders of the Western Union Company, he claims to be (Mr. Stearns' patents having since been purchased by his company) the "most important and valuable of all the improvements which have been made since the Morse telegraph was first established."—[EDITOR OF THE TELEGRAPHER.]

The Character, Disposition and Ability of Many Telegraph and Railroad Officials.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE often thought this world of ours would be a very pleasant and delightful place to live in if the human race were not disposed to be so selfish and exacting one of another. But man too often forgets the golden rule, and instead thereof acts upon what is sometimes called the silver rule—that is, do unto others as others do unto you, and by his selfish ways, and the harsh and unfeeling manner in which he treats his fellow man, he not only makes himself miserable, but also all with whom he comes in contact. In the language of the poet, "Man's inhumanity to man makes countless thousands mourn." Kindness costs nothing, and what a magic power there is in it who can tell? It will reach the heart and compel us to respect the one who exhibits it toward us. Who would not do all in his or her power to please one who thus treats them kindly and encourages them? I refer particularly to employer and employé, and in order to make the matter still plainer, say railroad and telegraph officials and their employés. There are so many of these so-called officials who are in some way placed in positions of honor and trust, that are as undeserving and unqualified for the positions, they command as a child, and these are not exceptional cases, but very common; and, instead of matters improving in this direction, they are constantly growing worse and more unbearable, and in nine cases out of ten of such officials, who rise from some humble position in life to hold one of any importance at all, they entirely forget how very low down they themselves once were, and they seem to think they are fully licensed to abuse their fellow man who has the misfortune to be under their authority. They want everybody to know who they are and that they wear the brass collar. They very forcibly remind me of a story my grandfather used to tell of a man of his

acquaintance residing in Connecticut, who was elected captain of militia in his native town, and was so elated over the matter, and wanted to be known by the name of Captain —, that he used to go out to his barn, and stick his head in a barrel, and call out, "Captain —." Now this man's qualifications and vanity fully illustrates the one half of our so-called officials who assume the management of railways and telegraph lines. How such men ever command these positions has always been a query to my mind, but how they manage to keep them is a greater query. They are undoubtedly a great detriment to the business. Now the kind of men we want for superintendents and other important offices are generous, whole souled and kind hearted men. Let such men as are referred to in the commencement of this communication study the life and character of our Saviour if they would learn a lesson of humbleness and self-sacrifice. He was never known to turn any away without giving them satisfaction, and if the Great Teacher could condescend to always speak kindly and encourage all who applied to Him, then I think men ought to be heartily ashamed of their way of treating those under them. I am glad we, as a fraternity have just such a paper as THE TELEGRAPHER, through whose columns we may express our views and defend our rights; and as THE TELEGRAPHER is not the organ of any monopoly, and is not kept up by any mammoth telegraph company, we may expect to see our cause fearlessly defended. I wish the whole fraternity would give THE TELEGRAPHER their support and encourage the editor in his work. MELVILLE.

The Character and Habits of Telegraph Operators.

TO THE EDITOR OF THE TELEGRAPHER.

IN reply to "Frankie's" note, I would say that there was a time when I thought that operators were indeed a "clownish set." I don't think I ever met with one but what he smoked, chewed and drank, and, in fact, some of them, after they have eaten their dinner, must have a little game of billiards before going back to their office. But in THE TELEGRAPHER of late I have seen some very nice and interesting communications from those who, I trust, are perfect gentlemen and true Christians. There was one over the signature of "H," if I mistake not, which I admired exceedingly. It showed a mother's careful training, and it made me feel glad to see his courage in saying "No," when asked by a friend to take a drink or a smoke. Oh, I wish there were more young men like him. May he always have strength to resist temptation.

You think, "Frankie," that he was not a very dear friend. At that time we were, and I use to enjoy going to his office, but since then we meet as strangers, but I trust we are friends. A reconciliation is indeed without hope.

I do not think I felt "sour," but am afraid I had a few hard feelings against "Aaron Around," for I do hate selfishness. No, I have not an office, and often feel discouraged, but still "I'll wait a while longer before I despair." I thank "Frankie" for his sympathy, and would certainly receive him as a student, but think he would make a great sacrifice, for he would be obliged to give up smoking and all the rest of his bad habits (which, I trust, are few). I will bid the readers of this paper a kindly farewell, for I think this is the last time you will hear from me at present, as I cannot afford to take THE TELEGRAPHER any more, at least not until I get an office, when I hope to have a few more "stamps" than I have at present. I have taken great interest in the correspondent's column, and regret that I am unable to unite with you to help along this interesting paper. Should "Frankie" like to hear from me personally (that is if he is unmarried) I will give the editor of THE TELEGRAPHER liberty to give him my address. NETTIE BRONSON.

Country vs. City Telegraph Operators.

CALIFORNIA, January 7.

TO THE EDITOR OF THE TELEGRAPHER.

IN your issue of the 27th ult. my attention has been called to the remarks of "Rover," who seems to look down upon we "country plugs" having country offices, as though he thought it was a disgrace to be the manager of a country office; and, also, his remarks for the placing of boys in the San Francisco office. Now, it is my fortune to have been connected with the Western Union lines for something like six years, and in that time have gained considerable knowledge of the "ticking of the instrument, and understand its "ling," at a moderate rate of speed, although not a first class man in my own estimation, as some of our young men are apt to think themselves, when actually they are only passable.

The reason why boys are employed in San Francisco is because the boys can send and receive what is given them to do as though it were a school, while we "country plugs" are holding responsible transfer offices—

money to the extent of \$1,000 to \$2,000 a month—doing as though it were a banking business, requiring a clear head and a knowledge of figures, facts and faces. We "country plugs" supply the San Francisco daily papers with all the interesting matter of our several country precincts, and our reports are published as sent, provided the San Francisco "first class operators" do not make a "cow's brother" of our dispatches. We "country plugs," in case of disturbance or breaking of lines, must mount our country plugs (horses or mustangs, as called here) and away with our blocks and tackle. Eighty-five to one hundred miles is not thought of by us. I have ridden one hundred and sixty miles in three days to repair a ground which another man had passed unnoticed. Do the first class operators of San Francisco know anything of making a splice, climbing a pole, riding broncos, or testing for grounds outside of the key? The sum and substance of "Rover's" remarks is that he has been superseded by the boys in San Francisco, and very likely would like now to take a back seat and become a "country plug." INDIGNANT COUNTRY PLUG.

Telegraphers Unjustly Accused and Characterized.

TO THE EDITOR OF THE TELEGRAPHER.

IT is a good time to think to-day, for the lines are all down, and I have only heard a faint click on my instruments once or twice during the day. I have sat here alone so long with no company or business, listening to the driving winds and rain as it rushes through the icy tree tops, that I feel (how shall I express it; blues don't begin) as though I would like to be at home, sitting in the little corner hack of the stove, with the old cat on my knee. (I'll warrant he don't get much petting now). How cosy it looks. I think most any one would appreciate the picture if they could only look with me out of my little window and see nothing but trees, with not even the smoke from some straggling chimney in sight. Having nothing much to do I have been reading THE TELEGRAPHER, and since laying it aside I have been wondering whether anything I could say would entertain or give any one as pleasant thoughts as the communication over the signature "Melville," in your first issue of the New Year, has given me. It seems good to hear once in awhile that there are some who think there is still some chance of operators escaping from the charge of total depravity. I should think, from some of the communications in the last four or five numbers of our paper, that the writers had been getting in very bad company by the way they depreciate the whole fraternity. (I have heard it said that "birds of a feather will flock together.") Let us have a rest on the moral and social standing question, and if some one must be abused, take some other profession, by all means. If we don't respect ourselves the public won't, surely. N. R.

Practical Suggestions.

MICHIGAN, January 14.

TO THE EDITOR OF THE TELEGRAPHER.

HEARING my brother operators around me making suggestions, and good ones, too, I think I will make at least one. It is this: That we be more careful in future, in sending messages, to put in the periods, and when necessary, even the commas. I have received not a few messages which could be read two ways; either way with equally as much sense as the other. Now, by inserting the period, the message would be made to read with a definite meaning. The party receiving may be expecting the message, and thus be able to read it with the true meaning, while again it may be an enigma to him, and possibly cause serious trouble, all from the omission of that little period. Let us hear your opinion upon the subject. SENTINEL.

Phenomena of Induced Currents.

THE induction current is very generally employed, as is well known, in the stimulation of nerves and muscles. A new fact in this connection has been pointed out by Mr. Onimus, and is worth noting by physiologists. It is that the physiological effects differ according to the material of which the wire is formed. He made exactly similar coils of copper, lead and German silver wire, of 210 metres in length and of equal diameter. They were submitted in the same way to the action of the inducing current. It is stated generally, that when the wire for the induced current is of a metal that conducts electricity badly, the contractions are much stronger, and the impressions on the cutaneous nerves less vivid than with good conducting wires, such as copper. The current induced in the badly conducting wires has much greater tension than that in good conductors. Various experiments are described, which appear to show that German silver may with advantage be substituted for copper wire in certain cases.—*English Mechanic.*

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

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DEVOTED TO THE INTERESTS OF THE

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Published Every Saturday,

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The Arguments in Favor of and Against a Telegraphic Monopoly.

EVER since, in the progress of events, it became evident that comparatively short telegraph lines and small telegraph companies must be superseded by systems which should practically be national in their character, there has been a persistent effort to establish and maintain a monopoly of the telegraph business of the country. The Western Union Telegraph Company is the outgrowth and result of this effort. The policy of absorption and consolidation of opposing and competing telegraph lines and companies has been steadfastly pursued, and line after line, and company after company has been brought into that organization, until it has become the largest and most powerful telegraph organization in the world. The purpose of its managers past and present to make it practically a monopoly has neither been disguised nor denied.

It cannot be denied that the arguments in favor of such a monopoly have much weight, and that certain important advantages may be secured thereby. It is claimed that one organization can conduct the business more economically than if it be as now and heretofore carried on, by two or more organizations, covering the same territory, with opposing interests and duplicate offices, employes and officials. This is undoubtedly true, and if the interests of stockholders were alone to be consulted the argument must be decided in favor of the monopoly. But besides the interests of proprietors those of the public who are not owners of telegraph shares, and who patronize the lines, and of the employes who depend upon telegraph employment, are to be considered. The advantages to be derived are, in our opinion, more than offset by the disadvantages to the two classes above mentioned. While the business would perhaps be more profitable, experience has shown that the public would find in an established telegraphic monopoly less regard for the interests and convenience of its patrons than when these have the option of employing its facilities, and, if dissatisfied with the manner in which its business is conducted, of transferring their patronage to a competing line. The important reductions of charges for telegraphic service are unquestionably due in great part to the existence of rival organizations. These may and probably have been of late more or less influenced by the urgent attempts which have been made to transfer the entire business to Government ownership and administration, but this has had less effect than the other cause mentioned.

As regards the employes, there can be no doubt but that their condition and compensation is influenced favorably by the existence of telegraphic competition, and the fact that they have to some extent a choice of employers. It creates a rivalry for the service of the better qualified among the employes, and enables them to secure far better terms than if there were but one organization to which they could apply for employment.

Another argument which the monopolists urge is, that one organization being more wealthy and powerful than if subject to competition, it would be enabled to afford more complete and extensive facilities, and better provide for the expansion and growth of the business. This argument, too, is not without force, abstractly considered, and if we had reached that millennial period when men, and aggregations of men into corporations, should seek not merely their own but their neighbors' profit as well, would have much more force than under existing circumstances and conditions. The object for which telegraph as well as other corporations are established is primarily to make a profit from the business transacted. These will extend and expand only so fast and so far as may be necessary to secure a profit on their business. Monopolies are seldom as energetically managed as when they are subject to the spur of active competition, and, provided the balance sheet is all right, and the dividends satisfactory, there will be but little effort to provide facilities which involve the investment of additional capital, perhaps not immediately remunerative. A telegraphic mo-

nopoly once assured, there would be a hesitancy about extending lines and increasing facilities which does not now exist.

The foregoing are the arguments which are principally relied upon to justify the establishment of a monopoly of the telegraphic business of this country in the hands of the Western Union Telegraph Company. That they are plausible is admitted—that they are fallacious we think has been demonstrated. It is not for the interests of either the public or the employes that the efforts which are made to establish such a monopoly shall succeed, and we do not believe that they will succeed. The genius and character of the American people is opposed to monopolies, and especially to a telegraphic monopoly, and there is no doubt but that if every existing competing telegraph line and company should be absorbed into the Western Union organization, the means would be speedily furnished to establish new ones.

We have just seen one of the leading competing telegraph organizations consolidated with the Western Union, and already plans are being perfected to cover the routes formerly occupied by that company, on which there are now no competing lines. So would it be if the others were to follow the Pacific and Atlantic into that mausoleum of telegraph organizations—the Western Union Telegraph Company.

The true policy of the companies outside of the Western Union combination we have pointed out time and again, and the opportunity is now presented for the adoption of this policy. It is the only safe one, and the only one by which an organization capable of competing effectively and successfully can be established. It is to follow the example of their adversary and consolidate the several companies into one organization, under one management, and then extend the system until, like the Western Union, it becomes general and national. The interests of investors, the public and the telegraph employes demand this, and if it is not done, those who are responsible therefor will be very much to blame. We believe that it only requires that some responsible parties should take the lead, and it can and will be effected, now that the principal obstacle, the Pacific and Atlantic Company, is out of the way.

The railroad companies, to whom the telegraph under their own control and management has become almost indispensable, are deeply interested in the matter, and may very well take the lead in such a consolidation. Any telegraphic monopoly is adverse to their interests, and would inevitably subject them, once established and assured, to burdens and restrictions of which they have had during the continuance of the Morse patents some experience. So much greater as their telegraphic interests are now than they were then, so much more onerous would they find the reestablishment of the control of a telegraphic monopoly. They should be wise in time, and at once move in this matter of such great importance to them.

Discouraging Experience of a Friend of The Telegrapher.

A COMMUNICATION from a friend of THE TELEGRAPHER, which we print this week, details some rather discouraging experience in soliciting subscriptions for this paper. This is but a sample of many such statements which we receive on this subject, and we print this to show the frivolous character of many telegraphers, and of the excuses and evasions resorted to for the purpose of avoiding contributions to the support of the organ of the telegraphic fraternity.

It is true, as stated by our correspondent, that we are endeavoring earnestly to secure the elevation of the character and standing of the telegraphic fraternity. It is also true that the progress made in that direction is slow, and our experience somewhat discouraging. Yet we believe that the influence of THE TELEGRAPHER is beneficial, and that the information and instruction which it is constantly imparting is of much value, and increasing the efficiency and professional ability of its

readers. Were it not for this the labor and responsibility imposed would indeed be poorly compensated.

In the last issue of THE TELEGRAPHER we briefly referred to this subject, and do not know that there is much to add to what was then said. There are but few telegraphers who cannot, if they desire to do so, afford the small sum of two dollars per annum for the weekly visits of the paper, and, without intending to be egotistical, we think we may properly claim that they receive many times the value of their investment during the year. The excuses and evasions made are not creditable to those who make them, and show either gross ignorance and incapacity, or that they are more inclined to devote their money to sensual gratifications than to that which will improve them in the profession through which they seek to obtain a living.

There is another view of the matter which is worthy the consideration of such persons. The better qualified they become, and the more intelligence they exhibit, the better will be their chances for promotion and compensation. The complaints of insufficient compensation are, in many instances, not just. Probably a majority of those who thus complain actually receive fully as much compensation as their ability and acquirements entitle them to, and in many instances much more than they could receive in any other capacity. We desire that all telegraphers should be properly compensated, and it is to be regretted that the evil effect of the employment of incapable and insufficiently instructed operators is not limited to themselves. They not only injure themselves, but they give to the fraternity, generally, a low standing, and too often the whole are judged by these inferior members. This is not just, perhaps, but it is unavoidable. If the business was relieved from the incubus of their presence it would be greatly to the advantage of all who are worthy the name of practical telegraphers.

We do not make these remarks so much in the interest of THE TELEGRAPHER as in that of the fraternity. As we have before stated, it is the right of any person whose support for this paper is solicited to decline it, but let them put it on the true ground, and not pretend that impecuniosity is the cause, while they weekly or monthly squander much more than the amount of the subscription in things not only of no benefit, but most frequently of actual damage to them.

True Worth.

SOME excellent and timely remarks upon the above subject appeared in the last number of our official contemporary, after reading which we feel compelled to say that, while no well informed person for a moment supposes they can have any practical application under such a perfectly organized system of civil service as that now in force at the Western Union headquarters, yet there is, nevertheless, much reason to fear that the injudicious publication of articles of this kind may afford opportunities for evil minded persons to insinuate that some deeper signification is intended than is at first sight apparent, which would, to say the least, be a very unfortunate circumstance, and one eminently calculated to make the judicious grieve. At the same time, there is so much sound philosophy and undeniable truth in the observations of our contemporary that we feel that it would be an injustice to our readers not to reproduce them. They are as follows:

"A really modest and meritorious person will never make pretensions of any kind. His manner and expressions will always have a tendency to underrate his real ability, not because he will pretend to be less capable than he really is, but as so many men have become pretentious in their manners and expressions, he fears he may be considered as such. We are, in consequence, too apt to consider the extent of the capacity of those whom we meet a little below the standard indicated by their acts and expressions. Therefore, true merit is seldom properly appreciated, and its cultivation is never greatly encouraged. On the contrary, pretence is almost always successful. He who is pretentious affects the interests of society in a similar manner as the swindler. He induces men to doubt the capacity of others, and often refuse aid and employment, because they measure the merits of all by those

of the pretentious fop and the conceited ignoramus. Many an honest and skilful man, and many a valuable improvement, has been refused support and adoption because the pretentious swindler has previously misled the people and imposed upon them outrageously. Pretensions of every kind are the true indications of a weak mind or a would-be swindler."

A Destructive Sleet Storm.

THE recent storm was very severe in Central and Southern Ohio, and the telegraph lines suffered greatly. Ice formed on the wires nearly two inches in diameter, with icicles depending therefrom from two to six inches in length. Immense numbers of poles were broken off, and where the poles withstood the strain the arms and brackets were stripped off by wholesale. On the Marietta and Cincinnati R. R. not one of the three wires was left in working condition for half a mile in any one place, for a distance of fifty miles. The oldest wire of the three was broken, as a correspondent remarks, "in 1,000,000,000 places by actual count," and is to be replaced by a new one. Such storms often do good service by annihilating a great many lines that have outlived their usefulness, but are in the disheartening condition of not being good enough to work, and a little too good to throw away. From the accounts of the storm which have reached us, we think it probable that there are not many of that sort of lines left in southwestern Ohio at this writing.

A Chance for a Little Civil Service Reform.

THE inventors of the country are under the greatest obligations to Commissioner LEGGETT for the many reforms and improvements he has introduced into the patent office, and especially for the tasteful and convenient manner in which not only the patents themselves, but the official reports and decisions are gotten up, and the means provided for obtaining them with the utmost promptness and the smallest amount of trouble and expense. But "if not inconsistent with public interests," as they say in Congress, we do wish that the Commissioner would try and get a person who has at least had an introduction to Webster's elementary spelling book in place of the present official who prints the titles of the inventions on the photo-lithographic drawings attached to the patents. According to his orthography the Page patent is for "Indiction Coil Apparatus and Curcuit-Breakers," and we also observe that Mr. Farmer has a patent upon "Electro-Magnetic Telegraphs." Give him a cold potato and let him go.

The January Magazines.

THE INDUSTRIAL MONTHLY.

THE January number of this handsomely printed and well conducted publication has reached us, and is one of the most valuable of all our exchanges. We reproduced some of its articles in another part of this paper. The present number is illustrated with two handsome chromo-lithographs of machinery. One excellent feature of the *Industrial Monthly* is the publication of a list of all the articles of any importance appearing in the current industrial literature of the world, by means of which any one who is only interested specially in one particular branch of science may ascertain whether any one of the scientific periodicals of the month contain anything of value to him without being obliged to take them all. For our own part we consider this feature alone worth the price of the whole work which is only \$1.50 per year. The publication office is at 176 Broadway, New York City.

Telegraph Poles.

THE great and increasing demand for telegraph poles in this country, and the constant and rapid decrease of available timber has made them difficult to obtain and increased their cost. With the opening of spring telegraph construction will be resumed, and we therefore render a service in calling attention to the advertisement of Mr. COLBY, of Toronto, Canada, who offers to

furnish first rate cedar poles at reasonable prices, delivered at the Lake ports.

We know Mr. COLBY, and have no hesitation in recommending him to the consideration of those who may need telegraph poles, who can deal with him with confidence that he will furnish a good article, and that what he contracts to deliver they may rely upon obtaining.

History of Postal Telegraph Schemes.

ATTENTION of parties interested is called to the advertisement of the documents published by the government, telegraph companies and others during the last six years in connection with the schemes for a postal or government telegraph. This offers a rare opportunity to obtain a complete copy of all these documents.

Numbers of Volume IX wanted.

WE are very much in want of a few copies of Nos. 342 and 351 of Vol. IX of THE TELEGRAPHER, to complete files. Any person who may have either of these numbers to spare will confer a great favor by sending them to this office.

Personals.

Mr. HENRY VAN HOEVENBERGH has been appointed Assistant Superintendent of the Gold and Stock Telegraph Co., in charge of all printing instruments and wires connected with the New York Commercial News Department.

Mr. W. W. BURHANS, lately in the employ of the Pacific and Atlantic Telegraph Company, New York, has accepted the position of night manager of the Washington, D. C., office of the Southern and Atlantic Company.

Mr. C. R. DART has resigned his position with the Atlantic and Pacific Telegraph Co. at Troy, N. Y., and gone to California for his health.

Mr. E. P. MCMANUS has resigned his position with the Franklin Telegraph Co. at Washington, D. C., and retired from the business.

Mr. WM. GARLAND has accepted a position with the Atlantic and Pacific Telegraph Co. at 198 Broadway, New York.

Mr. M. C. GROSS formerly with the Pacific and Atlantic Co., Chicago, Ill., has accepted a situation with the Atlantic and Pacific Co. in that city.

The Telegraph.

Telegraphic and Electrical Brevities.

THE Western Union and Arizona Military Telegraph offices were yesterday opened in their new quarters in Josse's brick building, corner D and Fifth streets. Under the competent direction of Manager Smith the rooms have been conveniently fitted up, and there is no neater telegraph office in the country than that of San Diego. The public will be perfectly accommodated, while the operating room, battery room, etc., afford ample space for the business of the lines. The location is a very fine one, and is generally satisfactory. —*San Diego (Cal.) Union.*

The unfortunate Spanish frigate *Arapiles*, which has been detained so long at the Brooklyn Navy Yard, and which has met with a series of misfortunes somewhat discouraging to her officers and crew, while passing down the East river, dragged her anchor and tore up and damaged the seven wire cable of the Gold and Stock Telegraph Company, which is laid from the foot of Jackson street to Brooklyn.

Hooper's Telegraph Works have received the following message from Mr. France, their engineer in chief, announcing the successful laying of the Pernambuco-Bahia section of the Western and Brazilian Company's cables: "Cable successfully laid on the 11th of December. Insulation superb. Start from Rio about the 25th."

The Quotation and District Telegraphs in England.

THE managing director of the Exchange Telegraph Company in London gives notice that the company will give daily at about 4 P. M. the "opening prices" on the New York Stock Exchange of a few of the leading stocks and shares, the rate of exchange, price of gold, and the general tone of the market; as also special extra messages, should circumstances render such necessary. He also announces that, "among

other things, we are introducing the 'call system,' as now worked at New York, by which householders can call a messenger, cab, medical man, police, or give the alarm of fire, and so soon as the system is worked out, it will be started in the metropolis; in the meantime we are giving it free to our subscribers on the Stock Exchange, for the purpose of calling members from the House to their offices."

The Concession for a Telegraph Cable between Peru and Chili.

THE Lima, Peru, correspondent of the *Panama Star and Herald* writes, under date of Dec. 20th, 1873, that on the 18th instant a decree was made public by the Minister of Public Works granting permission to Mr. Charles Scott for the construction of a submarine cable between Callao and some port to be named in Chili. Mr. Scott is the representative of the India Rubber, Gutta Percha and Telegraph Works Company of London, and offers to lay the cable without special privilege or guarantee of any description, within the term of eighteen months from date. The port to be selected in Chili will probably be Caldera, from whence a land line runs to Valparaiso and thence across the Cordilleras to the Argentine Confederation. When we have Mr. Scott's cable and that between Payta and Panama in operation, it will be an easy matter for the inhabitants of Buenos Ayres and Montevideo to wire their greetings *via* Santiago de Chili and Lima to friends in the old world. Owing to the malevolence of a discharged employe, the wires were cut between Payta and this city, and the first intelligence of the attitude assumed by the United States towards Spain in the Virginius question, reached us with the steamer Lima on the 17th instant.

Irregularities of the West India and Panama Cable.

MANY complaints have reached us lately of the great delay in the transmission of messages by West India cable. We have heard of three instances within the past week in which messages from the United States were so long delayed as to be completely worthless when received. Some with business orders for return steamer from Aspinwall were not delivered till long after the steamer had sailed thence. We have similar complaints of messages from this coast to New York. Such management on the part of the company or companies is inexcusable. When the cable is broken, or not in working order, the fact should be made public immediately; and when delay is deemed unavoidable, the time of delay likely to occur should be given, otherwise the companies should be obliged to refund the cost of all messages kept back beyond a due time. The management of the cables between Jamaica and the United States has ever been such as to render them an annoyance more than a benefit to those patronizing them. It is high time some steps were taken to remedy the evil.—*The (Panama) Star and Herald.*

The Patent Congress.

A CONVENTION of patentees and persons interested in patents and patent inventions was held in Washington, D. C., last week, which was numerously attended. This Convention was in response to the recommendation of the International Patent Convention, held at Vienna during the International Exposition. The difficulties and disadvantages experienced by American inventors in foreign countries in their efforts to secure protection were discussed, and it was resolved to hold a grand International Patent Congress at Philadelphia during the Centennial Celebration in 1876.

Resolutions were adopted declaring that the production of inventions should be guaranteed by the laws of all civilized nations, and that a patent should be granted for a term of 17 years, with a privilege of extension for the benefit of the inventor or his heirs for a further term of at least seven years. A resolution was submitted recommending that Congress make use of the surplus fund of the Patent Office now in the United States Treasury for the erection of a suitable building in Judiciary Square, for the exhibition of the models of inventors. This fund is over \$1,000,000.

A permanent organization was formed, and it was recommended that State associations be organized. The following officers were elected: John S. Perry, of Albany, President; Dr. C. F. Stansbury, of Washington, Secretary; Hon. J. M. Thatcher, of Washington, Treasurer. Directors: T. A. Dodge, Massachusetts; C. P. Kimball, Minnesota; G. H. Christy, Pennsylvania; N. R. Graham, Illinois; N. C. Stiles, Connecticut; C. E. McDonald, Indiana; J. S. Boyle, Ohio; H. G. Bulkley, New York.

In one of the county schools in England the art of telegraphing is taught to the children with much success. The Postmaster General approves of the scheme, and is highly pleased at its adoption.

A telegraph messenger boy got his despatches mixed the other day, and handed a jockey a telegram which read, "Can you supply our pulpit next Sunday?" And to a well known clergyman a despatch which read, "The race is postponed till Monday. Can't you come down and spend Sunday?"

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended December 30, 1873, and bearing that date.

No. 145,997.—TELEGRAPH INSULATOR. Christian Fox and Elisha G. Heston, Gap, Pa. Application filed August 20, 1873.

An annular glass insulator, slotted in its upper face for the wire, fits over a stud and rests upon a shoulder on the supporting bars. A shed cap screws down upon the stud.

The combination of the nut-like cap C with its sheltering base to cover, clamp and protect the annular slotted insulator G B, when the latter rests upon the shoulder a, and the former receives the screw end D of a vertical shaft or support, A, the whole arranged in the manner shown, for the purpose set forth.

HISTORY OF POSTAL TELEGRAPH SCHEMES.

The important documents on this subject published by the Government, the telegraph companies and others, during the last six years; well bound; in one volume, of over 1,000 pages. One copy for sale.

Price, \$10.

Address, "THE TELEGRAPHER."

WANTED.

Wanted to know the whereabouts of ROBERT McCALLUM. Was operating on the B. and M. R. R. when last heard from. Any one knowing him, or having seen him during the past three years, will please communicate with his brother, ALEXANDER McCALLUM, Mendocine City, California, and by so doing will confer a great favor.

EUGENE F. PHILLIPS,

MANUFACTURER OF

REED & PHILLIPS'

PATENT INSULATED TELEGRAPH WIRES,

(PATENTED, NOVEMBER 18TH, 1873.)

Lock Box 169. PROVIDENCE, R. I.

Having recently enlarged our factory, we are now prepared to furnish at short notice any style and quantity of

BRAIDED LINEN or COTTON COVERED WIRE,

saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.

PAINTED, PARAFFINE or SHELLAC WIRES

also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.

We are also prepared to furnish a new style of

ELECTRIC CORDAGE,

which has been pronounced by all superior to any in the market.

The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.

Sample Card and Price List furnished when requested.

Phillips' Wire can be had of

- L. G. TILLOTSON & Co. New York.
- CHARLES T. CHESTER. "
- F. L. POPE & Co. "
- W. HOCKHAUSEN. "
- PATRICK BUNNELL & Co. Philadelphia.
- WATTS & Co. Baltimore.
- CHARLES WILLIAMS, JR. Boston.
- THOMAS HALL. "
- GEORGE H. BLISS & Co. Chicago.

General Superintendent's Office,

AMERICAN DISTRICT TELEGRAPH CO.,

NEW YORK, January 1st, 1874.

E. F. PHILLIPS, Esq.

Dear Sir: Your office wire is a decided success. We have used it exclusively for two years and consider it the best in the market.

Respectfully,

W. H. SAWYER, Gen'l Sup't.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

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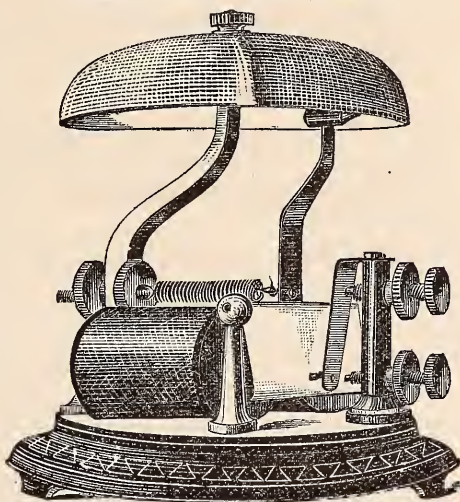
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One half of actual size

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PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

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- Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00
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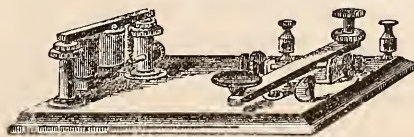
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that they have sustained the test of more than twenty years of
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COMPLETELY FAILED;

the few instances in which municipalities have been induced to
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has met with the universal approbation and commendation of
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a most compact and reliable Switch, forming a clean spring-
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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

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Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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American Compound TELEGRAPH LINE WIRE.
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And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

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ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

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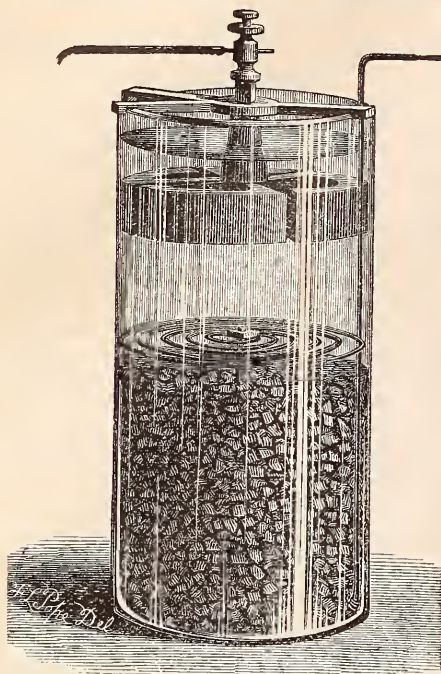
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1/800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1/150th to the 1/300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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LOCKWOOD BATTERY,

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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

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for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any attention whatever. The copper and zinc solutions are perfectly separated, and there is

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The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. *Send for Circular.*

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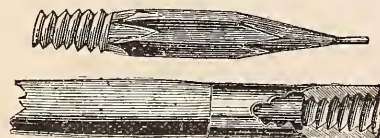
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"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

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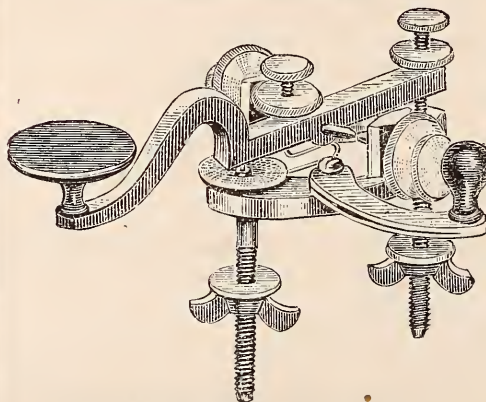
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A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



Price, \$5.50 plain; \$7 nickel plated.

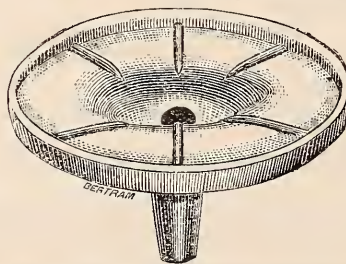
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DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,

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Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

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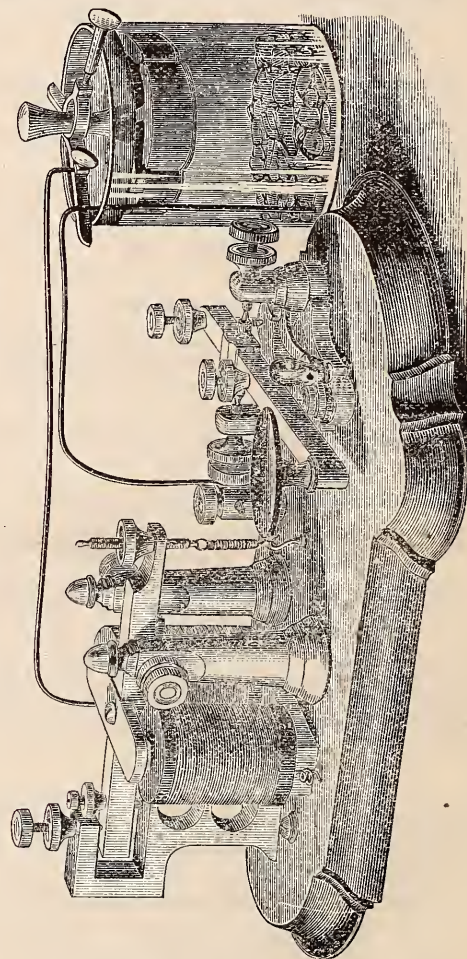
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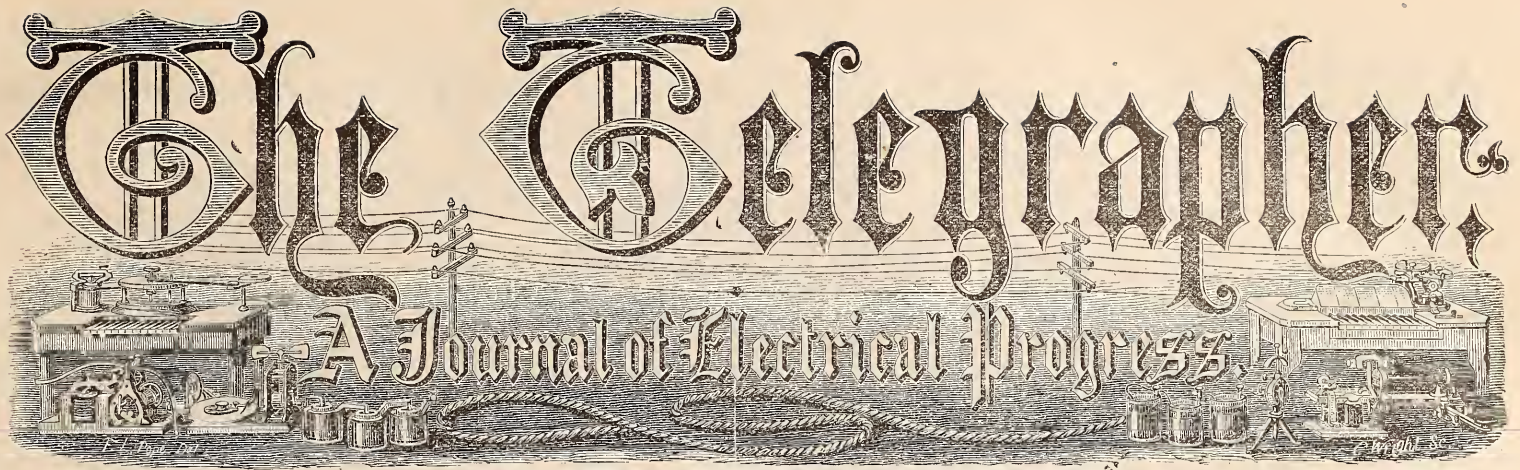
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, January 31, 1874.

Whole No. 394

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A SOUNDER of Entirely New Construction,
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 Also, **Telegraph Switch Cords,**
 many Patterns, Plain, Woven and Braided. Parties being partial
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 PATENT APPLIED FOR.
 The undersigned having secured the exclusive Agency for the
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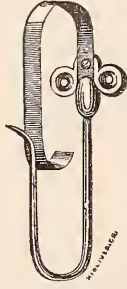
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 now offer them to the public as the best Battery for Telegraphic
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 The Battery cell is made of lead, and forms one pole of the
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 These Batteries have been fully tested during the last year,
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 Price.....30 cents each.
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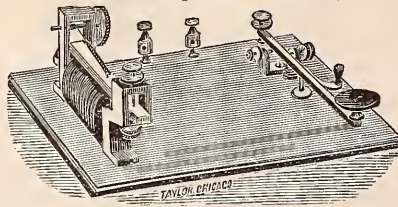
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TWO YARDS OFFICE WIRE,
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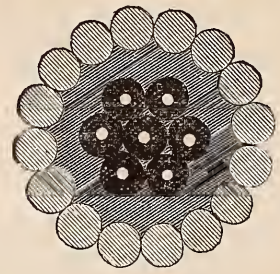
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JANUARY 31, 1874.

VOL. X. WHOLE No. 394.

Original Articles.

The Elementary Principles of Electrical Measurement.

BY FRANK L. POPE.

(Continued from page 13.)

Geometrical representation of the Phenomena of the Voltaic Circuit.

THE mathematical relations which have been shown to exist between the electro-motive force, resistance and current in a voltaic circuit, and which are expressed by Ohm's law, may also be graphically represented to the eye by geometrical projection—a process which often materially assists the student in forming a correct conception of a subject.

Let the resistances in any given circuit be laid off on a horizontal line, A B, figure 3, by means of a scale of equal parts. In the same manner let the electro-motive forces be laid off on the line A C, drawn perpendicular to A B, and let the latter line also indicate the zero of potential. A battery of 5 Daniell cells is represented in figure 3, the zinc and copper plates *z* and *c* being represented at such a distance apart as to correspond to an internal resistance of 2 ohms per cell. Let the total resistance of the circuit be 20 ohms, which will be represented by the length of the line between A and B. The total resistance within the battery is shown by the length of the line A D, and the resistance exterior to the battery by the length of B D.

Each of the five divisions of the line A C represents an electro-motive force of 1 volt, which, in this case, we will assume to be exactly equal to that of 1 cell, the total electro-motive force included in the circuit being 5 volts.

We have then in figure 3 a battery of 5 cells, each cell having a resistance of 2 ohms and an electro-motive force of 1 volt, and the copper pole of this battery is connected to an insulated conductor, B D, having a resistance of 10 ohms.

Now, let us suppose that the zinc or negative pole of the battery is connected to the earth at A, and that the opposite end of the conductor at B is insulated, or, in telegraphic parlance, "left open." In order to represent the difference of potential at every point of an open circuit, such as that under consideration, we must construct a line which may be termed the *line of potential*. The perpendicular height of such a line above the line A B, at any point, will indicate a corresponding difference of potential between that point and the line. In the present case this will be a positive potential.

As the first zinc plate at A is connected directly with the earth, which is assumed to be the zero of potential, as we have already explained, its potential must also be zero. But the first cell contains an electro-motive force equal to 1 volt, which we will, for convenience, assume to be situated at the junction between the zinc plate and the solution in which it is immersed. As will be seen by the dotted line in the figure, at each junction of the zinc with the liquid the potential rises 1 volt, attaining in the fifth cell a potential of 5 volts. But the whole of a perfectly insulated conductor, whatever may be its length, acquires the same potential as the pole of the battery to which it is attached, and, therefore, the potential of the line B D is equal throughout.

Next, let us take the same battery and conductor, and connect the end of the conductor B to the earth also, the latter, of course, having no appreciable resistance. The distribution of potentials throughout the whole system is now changed, and becomes as shown in figure 4.

Both ends of the circuit have now a potential of zero, and the potential decreases regularly from the last cell of battery at D to the earth connection at B. It will be seen that the potential line falls or decreases within the cells of the battery just as it does on the line. The steepness of this line represents what Ohm termed the *electric fall*. The degree of steepness represents accurately the strength of current in the circuit. If the units of resistance in A B, and of electro-motive force in A C, are laid off to the same scale, as is the

case in the above diagrams, a current of 1 farad per second would be represented by a line of potential leaving an inclination of 45°. It really has an inclination of just one fourth this, or 11¼°, showing that the current in such a circuit would be one fourth of a farad per second, which we find by Ohm's law to be the case, for

$$E = 5 \text{ (volts.)}$$

$$R = 20 \text{ (ohms.)}$$

$$\text{and } \frac{E}{R} = \frac{5}{20} = \frac{1}{4} \text{ farad (per second).}$$

Figure 5 shows the same battery placed on short circuit—its poles being connected together by the earth, a conductor of infinitely small resistance. In this case the potential rises 1 volt in each cell, as in the two previous examples, and the maximum potential is found at the junction of the zinc plate and the solution. In this case the line of potentials is much steeper, indicating that a much stronger current flows through the circuit. The inclination is in fact 22½°, or twice as great as before, corresponding to a current of one half

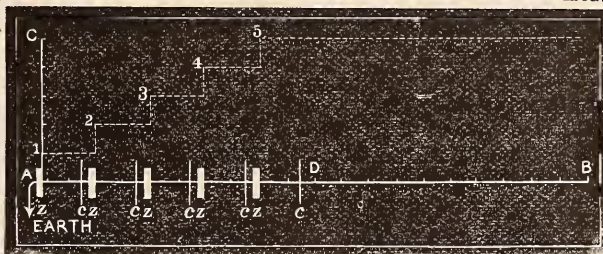


FIG. 3.

a farad per second. As before, we find by Ohm's law that this ought to be the case, for, we now have

$$E = 5 \text{ (volts.)}$$

$$R = 10 \text{ (ohms.)}$$

$$\text{and } \frac{E}{R} = \frac{5}{10} = \frac{1}{2} \text{ farad (per second).}$$

It is proper to state that the best authorities now consider that the change of potential which denotes the existence of an electro-motive force, does not actually take place at the junction of the zinc plate with the solution, as has usually been supposed, but at the junction of the *metals*, between two cells of the

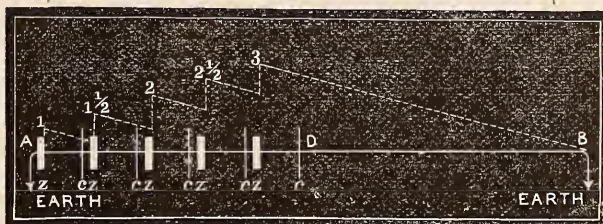


FIG. 4.

battery. This is in accordance with what is called the *contact theory of galvanism*, the truth of which appears to have been verified by experiments of a most convincing character.*

Phenomena produced by the Voltaic Circuit.

Having now defined our units of measurement, we will next consider how they are to be used. We can only perform electrical measurements by observing the effects of the electric current itself. These are exhibited in three different forms, viz., *heat, chemical action and magnetism*.

1. *Heat*.—When the two poles of a voltaic battery are connected by a thick wire having no sensible resistance, through which the current passes, the wire is

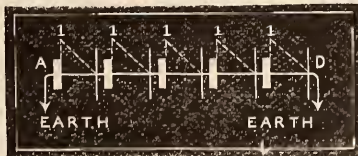


FIG. 5.

not perceptibly heated. Heat is actually developed by the oxidation of the zinc, but in this case it is confined to the battery itself. If, however, we substitute for the thick wire one which offers considerable resistance to the current, the wire will be heated, and if properly selected with reference to the quantity of electricity generated in the battery, may be raised even to a white heat.

* Fleeming Jenkin's *Electricity and Magnetism*, pp. 43 to 48.

The total amount of heat generated by the oxidation of a given weight of zinc is always absolutely the same, and is, therefore, strictly proportional to the current, or rather the square of the current or quantity of electricity which traverses the circuit, but it may be distributed in various proportions between the battery and the external circuit. These facts were established by Joule, who carefully collected and measured the amount of heat developed in a circuit under known conditions. This method of electrical measurement is seldom if ever used in practice, as others, hereafter to be explained, are vastly more convenient.

2. *Chemical Decomposition*.—When the voltaic current traverses a compound liquid conductor instead of a metallic one, the liquid is in many cases decomposed. This fact was discovered by Nicholson and Carlisle in 1800. Faraday devised an apparatus called a *voltmeter*, by means of which he proved that the quantity of liquid decomposed in a given time is absolutely in proportion to the quantity of electricity traversing the circuit. The voltmeter consists of a graduated tube, by means of which the quantity of gas generated in a given time is collected and measured. This instrument is found very useful in certain classes of measurements.

3. *Magnetism*.—When the voltaic current traverses a conductor, passing immediately in the vicinity of, and parallel to a freely suspended magnetized needle, as of an ordinary compass, the needle will be deflected, and will tend to assume a position at right angles to the direction of the current. This fact was discovered by Oersted in 1820. The greater the magnitude of the current the more nearly will the needle approach a position at right angles to the conductor. It is found, when proper precautions are observed, that the angles of deflection of the needle, under the influence of a voltaic current, are strictly proportional to the quantity of electricity passing, and such a needle, therefore, becomes the most convenient instrument for measuring or comparing the strength of different currents.

As the methods of measuring a current by its magnetic effects are by far the most generally available for practical use, the remainder of this treatise will be confined entirely to their consideration.

[To be continued.]

[From *The Ghost*.]

All About Us.

It is a common grievance, among men of all classes and conditions, all trades and professions, that, periodically, some one who has no personal knowledge of the matter, casts about him for information concerning their business, and then proceeds to print, with an amplification depending altogether upon the fertility of the writer's imagination, his second hand facts and first hand fancies. Meddling with tools of which one does not know the proper use, and skating on thin ice, are perilous pastimes. When the Rev. T. De Witt Talmage, not content with writing a book, saw fit to pretend to a knowledge he did not possess, he consequently came to be thought an ass by a large class of very intelligent men. We allude to the printers, who were offended at his implied familiarity with their business. He indulged in the hope, in the preface to his work, that some erring sister, some faltering brother, etc., might be, through its influence, won back to a purer life, for then he should not regret that his *manuscript had been caught up on the sharp teeth of the type*. Whether Mr. Talmage thought, because 'types are sometimes placed in a way that bites, that they have a full set of incisors, bicusps and molars, or whether he fancied that there was something thrilling in the idea of his manuscript being "chawed up," as there was in reality about his book being so disposed of on its appearance, we cannot state, but in any event there is no denying that the remark was silly and the figure as outrageous as could possibly have been introduced. And so it often occurs in treating of other subjects. Our own business is not often "written up," as the phrase is, and for that we may be thankful, but when it is we find ourselves glaringly misrepresented, and our manner of filling our place in the business economy of the country provokingly disturbed, the same as those of other professions whose cases are taken in hand and disposed of by that regular patron of free lunches—whose prejudice against clean linen is only equalled by his predilection for gin cocktails—the "penny-a-liner." In a New York Sunday paper of Jan. 8th the appended *brochure* occupies a conspicuous place. It will not be difficult for the reader to see where the writer reproduces what he has been told, for that is tolerably correct; but there is no doubt in our mind that he is wholly responsible for the flattering information that the average telegrapher cannot, for the life of him, explain how the sound of an instrument conveys intelligence. To him, moreover, is certainly attributable the

cheering statement to those aspiring to take "a first class position in an office," that one year's practice will fit them therefor; or, still better, that "plenty of operators have acquired proficiency in six months;" proficiency in swinging open the brass gate, unquestionably; proficiency in the "cust," "it don't come," "write Gerse," etc., phrases; certainly not in working a wire with care and judgment. We have not patience to allude to half the inaccuracies that appear in the course of the article; but we must not close without referring to the capers of the lightning as it goes flashing from the switch board and caroms on the different instruments, causing the operators to do the "demon's dance" fit to grace the most spectacular play. How familiar that scene has become to us! How often we have all tripped the light fantastic under those circumstances, and what a hit most of us would make in the spectacular line! Listen to the magpie, and see how you like it:

TELEGRAPHY.—WHERE OPERATORS COME FROM.—
UNNECESSARY DELAYS CAUSED BY THEIR
MULISHNESS, ETC., ETC., ETC.

Telegraphy is a mysterious art to a great majority of people. Introduce a stranger to the operating room of an office and the confused rattling of the instruments strikes upon his untutored ear as a miniature Bahel. It seems to him an impossibility for any one to distinguish aught of order in the general din, and yet on every side he can see the operators, with pen or pencil in hand, tracing letters, syllables, words and sentences upon the paper before them with the utmost rapidity of movement. If he becomes inquisitive, and asks questions, he will receive little satisfaction, for the average telegrapher simply knows the fact that the sound of an instrument conveys intelligence of some description to him, but for the life of him he cannot explain how the result is achieved.

To become proficient in the business of telegraphy requires constant, laborious practice for about three or four hours a day during the period of about one year. At the end of that time a candidate who has followed this course may be considered capable of taking a first class position in an office. This is the case with most men, but of course there are exceptions, and often disappointment attends every effort of individuals to master the art. Then, again, plenty of operators have acquired proficiency in six months' hard work, but such cases are rare.

As a rule, telegraph operators are either village bred or have graduated from the ranks of the messenger boys who are employed in every large city office, in numbers ranging from ten to a hundred. Operators are, in general, young men, and if their ages were averaged and compared with those of other professional men, they would undoubtedly be found to be the most youthful class. The reason for this can be easily explained. A boy can become a messenger in a telegraph office at the age of twelve years, and after spending from one to three or four years in this branch of the business the way is open to promotion. If the boy is smart, and shows it, he will be taken from the corps of messengers to fill a vacancy in the operating room. His duty there is to wait on the operators, remove messages as they are received, and take them from the dummy box as they are sent up from the receiving room to be sent to other cities. The work is light, and throws the youngster into the very heart of the business he is destined to follow. It would be impossible for an average youth to remain long in such a position without having his curiosity aroused, and he soon begins to tinker with the instruments.

At first he is sly about it, and hates to acknowledge before operators that he is making any effort to learn the business. They find this out, however, without being told so, and then furnish the tyro with a copy of the alphabet, with the significance of each letter in telegraphy, marked by dots . . . or dashes — — —, alongside. When the "check boy," as he is called, gets this far along he is bound to progress, and it is a proud moment to him when he discovers that he is able to make the letter "A" in a manner pronounced correct by the operator who is his particular patron. In three or four days, or, at the outside, a week, the alphabet is mastered. Nearly every new beginner has his particularly hard letter to overcome. Over that one letter he will work and puzzle for hours before he is able to sound it, and when he does so intelligibly, he has to keep practicing on it to train his fingers to make it correctly.

From learning the alphabet the boy begins to form conjunctions of letters and words, and with every advance he makes his interest increases, until finally he neglects no moment of spare time, and, after his working hours are over, remains in the office rattling away on a "way wire" instrument, and using up column after column of newspaper matter. In a very few weeks his finger joints seem to relax, and he can do anything with the key, from writing a single paragraph to playing the "Dead March in Saul." As a rule, beginners can send at the rate of twenty to thirty words

a minute before they can read a letter of the messages that come over the wires.

To acquire the knack of distinguishing between the confusion of noise made by an instrument at work requires long practice. It is by far easier to learn to send a message than to receive one. Generally, beginners entering upon the second and hardest stage of the study, practice together. Both students sit at the same table. No. 1 has one hand on the key and a newspaper in the other. No. 2 has his ear inclined toward the "sounder." No. 1 writes the alphabet slowly, letter by letter. No. 2, if he can catch the letters, repeats them. If he cannot, at the first attempt, they are repeated over and over again until he can read them. He first attempts to read the letters in regular rotation. After he succeeds in this they are written by the sender in every way. He writes the alphabet backward, or begins in the middle. In this way the listener learns to tell the sound of the letters in themselves, without reference to other letters. He can tell the sound of "K" without having "J" sounded before it.

From learning the letters the student soon becomes able to place them in words. Words become sentences, and, after a few weeks longer practice, he can read the messages that come over the wires with great distinctness. After this result is gained about half the work is accomplished. Then follows the task of conveying to paper the words that he reads in the ticking of the instrument. This part of the task is the hardest, and patience and constant practice are absolutely necessary to success.

Operators' salaries range from \$30 to \$40 a month up to \$120. The inferior class are never up to the standard of men fit to fill positions in city offices, and their employment is obtained in the service of railroad companies, or as holders of branch offices in hotels, etc., where business is very slack. In "main" offices, the hours of labor range at from 8 A. M. to 6 P. M. for day men, and 6:30 P. M. to the hour of closing for night men. Night operators are sometimes through work by eleven or twelve o'clock, but when storms prostrate the wires, or on occasions when the President's message is to be transmitted, they may be kept at work until six or seven o'clock in the morning.

It is very exciting to be in an operating room during a thunder storm. The lightning flashes over the wires, strikes the "switch board," caroms on the different instruments in the room, and causes the men to do a "demon's dance" fit to grace the most sensational spectacular play. Balls of fire play about the room, and the flash is accompanied with snapping noises of the most startling character. On such occasions the boldest of operators grow alarmed, and often business is entirely suspended during the prevalence of the storm.

Telegraph operators learn to cultivate a certain degree of worldliness, or it might be called callousness, that is born of the business they follow—messages affecting the most vital interests of the sender; messages to save life or to cause death, to enrich or to bankrupt, pass through their hands by the score every day. They know a great deal of the secret life of hundreds of men in this way, and it would be thought that this very experience would teach them the necessity of attending strictly to their business. That they do this is true of some, but there are scores of them who do not regard one message that may come into their hands of a whit more consequence than another. Often messages will be left in the counting room of a telegraph office, with instructions to the clerk to "rush it." The message is sent up stairs, the clerk whistles to the check boy, "rush this." The check boy tells the operator to do so, and the operator hangs it on a hook to rest until he shall have finished the particular chapter of the novel he is perusing. When he does turn his attention to it, lazily enough, the delay may have rendered it useless in achieving the object desired by the sender, and yet the operator does not feel that he has violated his duty in any particular.

Suits against telegraph companies for delay in the transmission of messages have often been brought, and sometimes successfully. The more of them that are instituted the better for the general public.

Can Electricity be Profitably Employed as a
Motive Power?

A New Answer to this Question.

THERE was recently on exhibition in one of our industrial expositions a series of pumps, worked by exhaust steam, over which was placed the startling announcement that, by means of them, water might be raised to a given height in quantity sufficient to drive a water wheel which would give out more power than the steam engine itself! The placard was well calculated to attract attention, but then nobody believed the statement printed on it, for the simple reason that no engine, far less the exhaust steam from one, could ever pump up water enough to drive a wheel which would give out half the amount of power of the original motor. The waste in pumping and the loss caused by

want of efficiency in the water wheel would be sure to consume the other half. Now, it happens curiously enough, that there are in common use two methods for producing dynamic electricity—one being the voltaic battery and the other any form of mechanical power. In regard to the latter, it is evident that the same principle holds true in regard to it that is true when applied to the water wheel and steam engine above mentioned. If electricity, which has been produced by the agency of mechanical power, be applied to the driving of an electro-motor, the latter can never be made to give out as much power as has been exerted by the engine employed to produce that electricity. In other words, no one could be found so foolish as to employ a steam engine to produce electricity for the purpose of operating an electro-motor intended to drive machinery. It would evidently be vastly more economical to drive the machinery by means of the engine itself, without the intervention of any complicated apparatus.

This proposition is so self-evident that it requires no elaborate demonstration; but from it follows the very obvious conclusion that, if by means of the steam engine we can produce electricity more cheaply than we can by the voltaic battery, then it is evident that the battery cannot compete with the engine as a source of power, no matter how perfect may be the electro-motor through which the energy derived from the battery is applied. Hitherto it has been claimed that the only difficulty in the way of applying electricity as a motive power, consists in the absence of a properly constructed electro-motor; but if it can be proved that electricity can be produced more cheaply by means of steam than by the consumption of zinc, then it is clear that even a perfect motor—that is to say, one that utilizes all the electrical energy, and converts it into mechanical power—cannot enable the battery to compete with steam.

Here, then, is a crucial test which is easily applied. And we believe that the results already attained do not leave the question in any doubt. In the case of the electro-deposition of metals, as well as the production of the electric light—two instances in which the comparison between the engine and the battery may be made with great accuracy—it has been found that the engine is the most economical. *A fortiori*, it should be far more economical as a source of mechanical power.—*Industrial Monthly*.

The Asiatic Cable.—Cruise of the Tuscarora to
Locate a Route for the New Cable.—Inter-
view with Commander Belknap.

THE United States steamer Tuscarora yesterday sailed from this port for the Sandwich Islands and Japan, with the purpose of sounding *en route* for a location for the proposed telegraph cable between Asia and the Pacific coast of the United States.

An interview with Commander Geo. E. Belknap yesterday morning elicited some interesting information in connection with the Asiatic cable enterprise and the cruise of the Tuscarora, which we here lay before the readers of *The Union*. The Tuscarora was detailed for her present expedition at the suggestion of Cyrus W. Field, the projector and conductor of the great Atlantic cable enterprise, who is at the head of the Asiatic cable scheme. The steamer was first ordered to survey northward for a route through Puget Sound and *via* the Aleutian Islands, and proceeded to carry out the instructions. Becoming short of coal she returned to San Francisco, where orders were received to go southward and survey the route from San Diego to the Sandwich Islands and Japan, returning by the northern route, if possible.

Commander Belknap thinks that the southern route, with a landing for the cable at San Diego, is by far the most feasible, and believes that it will in all probability be adopted.

The northern route to Japan *via* Aleutian Islands is beset with difficulties. It would be impossible to repair any break during the largest part of the year, there being but four months in which those northern waters are open to navigation.

A route from San Francisco has apparently not been thought of. It would be well nigh impracticable to land a cable in that vicinity on account of the rocky nature of the bottom at that part of the coast.

A line from San Diego *via* Japan to the Sandwich Islands is the most practicable; first, because it would lie in the "calm belt of the Pacific," and the cable could be laid down and repaired at any time during the year; second, as a connection with the Sandwich Islands is the evident purpose of the scheme, this line is geographically the best, the branches to Japan and Australia being short and of easy access; third, the cable should connect with an overland wire not subject to interruption, and by the time the submarine line would be laid there would be a southern overland line between San Diego and the east which could be constantly operated. It is a well known fact that communication by the existing overland line is constantly interrupted

hy storms; this would never be the case with a line running eastward *via* the thirty-second parallel. In every point of view the advantages of taking the southern route, and making the landing at San Diego, are so great that they can hardly be overlooked.

Commander Belknap hopes that he will not find over three thousand fathoms depth on the survey across. If a satisfactory result in this respect is reached, he thinks it will not fail to give the route from San Diego the preference—everything else being very greatly in favor of its adoption.

He will suggest that the cable be laid on the south side of the channel, landing on the Peninsula, from which point a land line would be built down the Peninsula around by way of La Punta and up the bay shore to San Diego. The shore from the Peninsula slides off very gradually to deep sea water; the bottom being soft and smooth, in which a cable would imbed itself by its own weight very readily.—*The San Diego Union.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., Jan. 28.

TO THE EDITOR OF THE TELEGRAPHER.

THE discussion before the Senate Committee on Post-offices and Post-roads of the Hubbard postal telegraph scheme, so called, was continued on Wednesday, Thursday and Friday of last week. President Orton, of the Western Union Telegraph Company, appearing and arguing at length in opposition thereto.

Mr. Orton concluded his argument on Friday, in which he maintained the proposition that Congress has not the right to pass a bill of this character, for the reason that it would indirectly take private property for telegraph purposes without just compensation, and that the passage of the bill would in fact be a violation of the contract between the Government and the telegraph companies now existing under the provisions of the Telegraph Act of 1866.

He further argued that if there were no constitutional objections, or violation of contract, the adoption of the Hubbard scheme, as contemplated by this bill, would be impolitic, because it constitutes a partnership between the Government and a private corporation, to be conducted by both official and private agencies operating at the same time, under which there is to be a division of expenses between the Government and the company, while any profits that may be realized will go exclusively to the latter.

It was further contended that, whatever the faults of the existing telegraph system of this country may be, the proposed scheme affords for them no adequate relief. It was shown from official documents and statistics that the present average rate for messages in this country is lower than in Europe for like despatches, and that here the business is conducted without any expense to the Government, while the annual deficiency arising from the telegraph service in Europe, raised by taxation upon the people, whether they used the telegraph or not, amounted to several millions of dollars.

Mr. Orton, in reply to the arguments of Mr. Hubbard, asserted that there was in fact no combination between the Western Union Company and the Associated Press, and that all other press combinations are offered by his company the same terms as the Associated Press, and that the establishment of a postal telegraph could not affect the Associated Press combination in any way.

The discussion has not attracted much public attention, it being conceded that there is no probability that Congress will take any definite action in regard to telegraph matters at this session, and that the Hubbard scheme especially, in any event, has no possible chance of success.

It is understood that Mr. Hubbard is to have a further hearing, in reply to Mr. Orton's arguments, by the Committee.

Aside from this matter nothing of telegraphic interest has occurred. CAPITOL.

Telegraph Matters in Oregon.

ALBANY, OREGON, Jan. 10.

TO THE EDITOR OF THE TELEGRAPHER.

ON Jan. 5th, 1874, Mr. F. H. Lamb, who for years past has been Sup't of the Fourth District, Pacific Division of the W. U. Tel. Co., from Portland, Oregon, to Victoria, B. C., turned the same over to Dr. O. P. S. Plummer, Sup't of the Third District from Marysville, Cal., to Portland, Oregon. Dr. Plummer will in future have both Districts under his supervision. Mr. Lamb started East on a visit to the Atlantic States on the

morning of the 6th inst., to be absent a few weeks, when he will return and take a District (we understand) with headquarters at Sacramento, Cal.

Dr. Plummer's headquarters have been moved from Albany, Oregon, to Portland, Oregon.

Mr. F. H. Lamb having resigned, Mr. J. W. Sweeney has been appointed Sup't of the Puget Sound Telegraph Company.

The following are trustees of this company, who are to serve this year, Messrs. O. F. Gerrish, D. C. H. Rothschild, Marshal Blinn, Cyrus Walker and M. Renton. The Trustees organized by electing O. F. Gerrish, President; Cyrus Walker, Treasurer; and James G. Swan, Secretary. This is a local line, built between and connecting all the ports on Puget Sound, and is doing a very good business. Headquarters are at Seattle, W. T. WEBFOOT.

Importance of the Telegraph to Railroads, and Insufficient Compensation to Railroad Telegraph Operators.

TO THE EDITOR OF THE TELEGRAPHER.

THE late ice deluge gave us a good opportunity to test the value of the telegraph department in the management of a great railway. The five wires which extend along the line of the Pittsburgh, Fort Wayne and Chicago Road were almost entirely prostrated for a distance of seventy miles east from Crestline, and the railway company was deprived of their use thereby during two days. During those two days the trains became most hopelessly mixed up and delayed, so that it required freight trains to put in about twenty-four hours on fifty miles of road as they joggled along from one jumble into another. The strike of the locomotive engineers a few days previously was decidedly mild in comparison with the trouble caused by the exit of the telegraph. Everybody was in a tub at sea, without compass or rudder, simply because the faithful little clickers were deprived of the power of giving forth their joyful sound. And yet, while the telegraph is proven to be a most valuable and indispensable part of the management of a large railway, and the telegraphers the most faithful and attentive in the discharge of their duties, their pay is kept at a rate but slightly in advance of the track repairers and coal heavers, who need not know a letter of the alphabet, or have any of the great responsibility which is attached to him who receives a train order from a rabid despatcher, the least error in which might consign to an untimely death scores of valuable lives and cause the destruction of property worth many thousands of dollars.

This, and much more fully demonstrates that the telegraphers, as a class, have just cause to cry out against the universal oppression with which they are burdened. Their invaluable services to the public, and especially to railway companies, coupled with the enormous load of responsibility under which they continually labor, and the large number of masters they are obliged to serve, demands double the compensation that any of them receive.

A closer union, honorable protection, and a firm demand for just rights, should be the watchword of the craft everywhere. MAGNETO.

The Remedy for a Sticking Key.

MEAFORD, CAN., Jan. 23d.

TO THE EDITOR OF THE TELEGRAPHER.

IN your issue of the 17th inst. I noticed a remedy for a sticking key, signed E. M. D., which I have tried, and am glad to say it has proved a success. I have been hithered terribly with a sticking key, and can say, for one, that this remedy alone is worth the amount paid you for THE TELEGRAPHER for one year.

A. GAULT, Operator.

Supply and Demand.

TO THE EDITOR OF THE TELEGRAPHER.

IN opposition to the theory of protection against the encroachments of capital, which is the corner stone of most trades unions, it is usually asserted that the law of supply and demand will regulate the rates of wages, and I believe you have editorially endorsed this argument. I wish to call your attention to the fact that a combination already exists in certain quarters, the object of which is to obstruct the natural demand for operators, by interposing official influence to prevent their securing more desirable positions. Among the young operators who are continually coming upon the stage, there are many who remain in situations where they neither have encouragement nor opportunity to rise, and who toil incessantly year after year, twelve or fourteen hours per day, at a very moderate compensation. If, perchance, a more agreeable position is tendered them, the machinery of the combination I refer to is immediately put in operation.

It is not to be expected that operators, so situated, can voluntarily secure a better place under the same

superintendent or the same company, but it is well known that some of these picayune officials have made arrangements with each other, and with railroad telegraph superintendents, under which they mutually refuse to hire operators who leave the service within the territory under their immediate control. Should a man, through some oversight, obtain a position within this hallowed precinct, it is probable he would be discharged immediately upon the fact becoming known to his late employer. Such contemptible scheming as this shows the calibre of the superintendent of the period, and if any of your readers have had any personal experience of this kind, I hope they will avail themselves of your columns to smoke 'em out.

CENTRIPETAL.

The Peculiar Characteristics of Different Operators.

BRISTOL, PA., January 22.

TO THE EDITOR OF THE TELEGRAPHER.

YOUR correspondent, "Jo." in his remarks on telegraphers' unions or associations, classifies operators as railroad and commercial operators. I desire to make a further designation, and will distinguish them as resident and travelling operators.

The resident operator, whether railroad or commercial, is what is termed steady and reliable. Generally he is old foggyish, precise, contented, hangs to old fashioned ways of doing his work, don't put his five words per line, or count as he goes. If he gets it down, "nuff sed." Usually is not addicted to the use of tobacco, and is very apt to be married.

Now for the other genus: He has a knowing look, is smart, with a moustache agonizingly undeveloped. Sports a tall hat, fashionable tights, a big ring and a girl. Don't care a cent whether school keeps or not; affects the traveller and is posted. Knows every Superintendent in the States and suburbs, and has worked for 'em all. Been discharged for every misdemeanor under the sun, and glories in it. Always financially busted. "By the way, Jones, can you spare a couple dollars till next week; it's all right, you know, ole feller, av coorse!" He does a nice gilt edged copy, puts on all the extras, and is generous to a fault when he has the means. Never saves a cent, and is never contented with his job. His monomania is to write to Superintendents for a "sit," and, if he is successful, leaves the one he is in for it. His morals are of the convenient type; is not naturally bad, but his principles are that the world owes him a living, and he acts accordingly. Is full of fun, telegraphic jokes, and the boys all like him. Girls ditto. This is a different race from the *old report operator*, thirty years at the business, who takes forty-five words Spencerian, can copy three messages at a time while sending with his left hand, diverting himself while so doing by Mazonkaing to other side of room to borrow a chew and talking to the boys. He can also strack a set of Hicks. His eyes resemble a pickled mackerel's from long practice on fourth proof, and can't stay sober long enough to get a job. You've seen him, eh? SPORTS.

The Western and Brazilian Telegraph Company.

AN EXTRAORDINARY general meeting of the Western and Brazilian Telegraph Company (Limited) was held on the 17th December at the Carman Street Hotel, London. The Chairman said the object of the meeting was to approve an agreement, made on the 8th inst., between this company and the liquidators of the Great Western Telegraph Company, relative to the cancellation of the shares issued to the shareholders of the latter company, and the allotment and issue of other shares of this company in exchange for said shares, credited with the like sum as paid up thereon. His colleagues at the Board, however, had requested him to state the present position of the company. The line from Para to Pernambuco was laid and at work. The ship Hooper was now on the coast, laying the southern portion of the line from Rio. The further lines between Rio and the River Plate had been purchased by the company and the deposit money paid. A repairing ship had been bought by the directors to sail along the coast and look after the cables. As soon as the ship Hooper returned home she would take out the West India cable, and he hoped the whole of their system would be completed and at work in a short time. Another satisfactory matter was that all moneys due to the contractors had been paid, and the company was absolutely out of debt. The resolutions approving the agreements, etc., were unanimously adopted.

THE Eastern Extension, etc., Telegraph Company's traffic receipts for the month of December, 1873, amounted to £20,400, against £14,797 for the corresponding period of 1872 for the four separate lines, viz., the British Indian Extension, the China Submarine, the British Australian and the Tasmanian Submarine Telegraph Companies.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

SATURDAY, JANUARY 31, 1874.

THE TELEGRAPHER:

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TENTH VOLUME.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS OF THE

Telegraphic Fraternity and the Advancement of Electrical Science and the Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of THE TELEGRAPHER will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

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All communications relating to or intended for THE TELEGRAPHER must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503,) NEW YORK.

Conspiracy to Oppress Telegraph Employees.— A Real Grievance.

WHEN some years ago it was found that a portion of the telegraph employes of the country had combined and established a League for mutual support and protection, great was the outcry against it on the part of Western Union officials, and most earnest the determination, at any cost, to defeat and destroy it. In this the company was successful, and, since then, except that at times the spectre of the League has seemed to trouble and terrify them, all has been serene, and with the exception of some grumbling and complaining through THE TELEGRAPHER, and spasmodic agitations of the Telegraphers' Association question, there has been little, so far as the employes were concerned, to disquiet them.

It is not our purpose to find fault with this or to agitate disturbing elements, but it seems to us that if combination on the part of the employes which may prove adverse to the interests of employers is so wicked and discreditable, combination on the part of the higher officials of telegraph companies and liars, avowedly adverse to the interests of the employes, is a wrong and outrage, and constitutes a real grievance which should be exposed and made public.

Our correspondent CENTRIPETAL, whose communication will be found in this paper, partially reveals such a combination on the part of Western Union and certain railroad telegraph officials, which is made avowedly to prevent, so far as may be in their power, any chance for the subordinate employes bettering their condition, or availing themselves of opportunities for exercising the liberty of selecting their places of service, or exchanging from one location to another, except as these officials shall be graciously pleased to permit. That this is wrong and an outrage there can be no question. In this country every person is supposed to be at liberty to select employment and employers, and, if an opportunity offers, to change both or either if it shall appear desirable or for their interest to do so. It is of course but right that in making such a change proper notice should be given of the intention to do so, and a suitable opportunity afforded to supply the service which is about to be withdrawn.

This is all that can in justice or equity be required, but this is not sufficient to satisfy some telegraph officials.

It has recently come to our knowledge that an arrangement exists, as before stated, between Western Union officials and certain railroad and other telegraph superintendents, by which an employe of either will not be given positions under the other without the permission of his former superior; or, if inadvertently an appointment be made, upon its being made known that the employe is a fugitive from the thralldom exercised by one of these officials, or has abandoned one for the other for a better position, easier labor or increase of compensation, the employe is at once discharged, and can either humble himself or herself, and, if graciously permitted so to do, return to his or her former, or a lower position under the old Superintendent, abandon the business, or starve.

As will at once be supposed this arrangement has grown up on the division which is under the management of T. T. ECKERT, and exists in all its force in the large district which is under the sway of D. H. BATES. Whether it exists on other sections of the Western Union and connecting lines we are not as yet informed. It may be so, but we doubt whether such an arrangement could exist elsewhere. If it does, the fact should be made known and the subject agitated until the injustice is corrected.

We concede the right of telegraph companies and officials to manage their business as they shall deem most advantageous, and to employ such persons as they shall deem most likely to serve them satisfactorily. We deny their moral and equitable right to combine to keep in subjection the employes, or to prevent them from exercising freedom of selection of employers and employment, and especially to prevent them from obtaining better compensation than they may have

previously been receiving. This is a conspiracy to oppress, and a real grievance, which should be agitated until it is removed.

We do not approve of telegraph employes constantly and capriciously changing from one line to another, for insufficient reason or for no reason at all, but if they can obtain situations it is their right to do so. How much stronger then is the right of steady, reliable employes, who after months and years of faithful service, seeing no probable reason to anticipate any improvement where they are, when the opportunity is afforded to secure such improvement by a change to avail themselves thereof? But just here the old employer says, "No, you must continue in my service whether you will or not. By an arrangement between your proposed employer and myself, only with my consent can your service be transferred!" If this is not slavery we are at a loss to understand the word. If the power of such men as we have mentioned was only equal to their desires, they would be despots whose tyranny and oppression would equal any that has ever before been experienced.

It is inevitable that combination will be met by combination, and if telegraph companies and officials do not desire that their employes should engage in such, they must not attempt on their own part to combine against them. We may have something more to say on this subject hereafter if the above should continue, and in the meantime desire the fraternity throughout the country to inform us whether such a combination exists in their respective localities,

The Hubbard Telegraph Monopoly.

AS HAS been stated by our Washington correspondent, CAPITOL, the proposed HUBBARD telegraph monopoly has been discussed for several days before the Senate Post-office Committee, by Messrs. HUBBARD, ORTON, PRESCOTT and others, for and against. The arguments adduced on either side were of the stereotyped character, and are too familiar to our readers to make it worth while to reproduce them at any length in our columns.

There is so little really to be said in favor of Mr. HUBBARD's proposed telegraphic monstrosity that it is difficult to understand how it is that a committee of the Senate should need lengthy argument in opposition to it, or should give it serious consideration even; but they do, and not only so, but once or twice at least have reported favorably upon it. It has the advantages neither of a private enterprise or of a Government telegraph, and is to be established, if at all, only upon the ruin of existing telegraph interests, and with the certainty that it must eventually, and that at no distant day, be taken over by the Government, and at a largely increased cost to that which would attend the purchase of the lines and the establishment in the first place of the proposed Postal Telegraph.

The Postmaster General, rabid as he is on the subject of a Postal Telegraph, sees through the HUBBARD scheme and very sensibly opposes it. It should be effectually disposed of in some way, and not return Congress after Congress and session after session, to bother legislators and telegraphic officials uselessly and needlessly. How it can be done is beyond our knowledge, but that it ought to be there can be no doubt. That it will ever succeed we suppose no one besides Mr. HUBBARD and Senator RAMSAY seriously believes, and the two gentlemen named rely upon persistent worrying to effect the object, if it is possible to do it in any way. It has become a legislative nuisance and ought to be abated, but how?

The Page Patent Litigation.

THERE seems to be a probability that the validity of the PAGE patent will be thoroughly and legally tested. We have before mentioned in THE TELEGRAPHER the fact that suits had been commenced in the United States Courts against the Manhattan Quotation Company and Mr. CHARLES T. CHESTER, of this city, for infringement of this patent, and they are to be contested to the end, and its validity as affecting telegraph

instruments and apparatus, either established or denied judicially.

Our readers are fully aware of our opinion in this matter, and we have shown, as we think, conclusively, that Prof. PAGE was not the original inventor of the devices for which a patent has been granted to him, and that in fact the patent is an outrage on the public, who have paid largely for these same devices to other patentees, whose patents have expired and become public property. So well convinced was the Western Union Company of the invalidity of the patent that, when first offered to them for purchase, after an investigation by experts and eminent patent lawyers, it was rejected. It was subsequently purchased by that company for good and sufficient reasons, no doubt, not connected with its validity, and has for the last three years been held *in terrorem*, over the telegraph interests of the country, not connected with the Western Union—no serious attempt having heretofore been made to enforce it.

It should, by all means, be disposed of as early a day as possible. If properly contested that it can ever be maintained legally we regard as an impossibility.

The resources of the Western Union Company will enable them to press the matter, and the contest will be protracted and expensive. All who are interested in defeating it should at once join hands with the defendants and make common cause with them, sharing the expenses as they will the benefit of success. The railroad companies are especially and vitally interested in this matter, for if the PAGE patent be once established, they are at the mercy of the Western Union Telegraph Company, so far as their telegraph facilities are concerned, and will be made to pay roundly for the exemption from such control during the last few years, since the MORSE patents expired. They should be wise in time, and cooperate with those who are engaged in supporting the independence of the telegraphs of the country.

The Western Electric Manufacturing Co.

THE Western Electric Manufacturing Co., of Chicago, Ill., seems to be in a sound and prosperous condition, considering the hard times. They have kept a full force at work at full time during the fall and winter, and have met all their engagements promptly, and we are pleased to learn that they find a good demand for the products of their shop.

The company, instead of decreasing its production, is branching out and adding an entirely new department to their manufactory, in the shape of apparatus for insulating all descriptions of office and magnet wire. They have purchased of Messrs. OLMSTEAD, MEAD & Co., of Providence, R. I., their machinery for this purpose, and are setting it up in Chicago, adding new apparatus for the winding of silk and cotton magnet and resistance wire.

This company does business on its own capital, and its business is not limited to any one branch of electrical work, and all branches do not fail at the same time. Again, its workmen and employes are stockholders, and are thus working for themselves, and remain permanently in a shop where they have an interest in the profits, in addition to their wages. This naturally secures good workmen, interested in making a superior article, and who do their work economically, wasting neither labor or material.

Those having occasion to use insulated wire of any description will do well to patronize the Western Electric Company.

Personals.

Mr. O. K. TOMPKINS, recently of the Dubuque, Iowa, Pacific and Atlantic office, has been appointed Day Assistant of the Northwestern and Western Union office at McGregor, Iowa—the great increase of business at that point necessitating an increase of the force.

Mr. E. A. DENNIS has been transferred from the Augusta, Ga., to the Charlotte, N. C., office of the Southern and Atlantic Telegraph Company.

Mr. C. D. CASE has resigned the position of Ticket Agent and Telegraph Operator at the Broadway ticket office of the Midland R. R. at Paterson, N. J., and returned to his home in New York State.

Mr. F. M. HUNTINGTON has been transferred from the Train Despatcher's office at Jersey City, N. J., of the New Jersey Midland R. R. to the Broadway Ticket Office at Paterson, N. J.; the despatchers doubling up on their work at Jersey City.

The W. U. Company have established an office at Congress Hall, Albany, N. Y., which is in charge of Mr. J. F. McAULIFFE, transferred from the main office.

The W. U. office at the State Capitol, Albany, N. Y., has been reopened for the Legislative season. Mr. J. A. OSBORN, late of Hartford, Conn., is the operator in charge.

Mr. W. F. SMITH, late of the W. U. and P. and A. Co., has accepted the position of signal operator at the Dudley Observatory, Albany, N. Y.

Mr. H. C. WINELAND, formerly in the Kansas Pacific R. R. office, State line, Kansas City, Mo., is now extra operator on the Pittsburg Division of the P. R. R.

Mr. CHARLES RUSHMORE, Secretary and Treasurer of the American District Telegraph Company, of Brooklyn, N. Y., has resigned.

Mr. H. L. HUES, Manager of the Western Union Telegraph Co., Brooklyn, N. Y., has been appointed Secretary and Treasurer *pro tem.* of the American District Telegraph Co., to fill the vacancy from the resignation of Mr. CHARLES RUSHMORE.

The Telegraph.

By Cable.

KINGSTON, JAMAICA, Jan. 24.—The Telegraph Construction and Maintenance Company have (17th inst.) succeeded in submerging a new cable between Jamaica and Porto Rico. It is laid to Ponce, on the south coast of Porto Rico. Everything is working well, but the line is not open to the public. The former cable was laid along the north side of Porto Rico to St. John, but in consequence of strong currents to the east of Porto Rico, the change of route has been considered necessary.

The Brazilian Telegraph.—Celebration of the Completion of the Line.

By the mail steamer South America, which arrived at New York on the 22d inst., advices from Rio Janeiro to Dec. 26th, and Bahia to Dec. 30th, have been received.

The Hooper Telegraph Company had completed their cable from Bahia to Rio—the steamer Hooper arrived at Rio with the final end on December 25th, and now there is complete communication from Para to Pernambuco, Bahia and Rio. The completion of the line was celebrated by a grand banquet and dinner at each of the above named ports on Jan. 1st. The Emperor of Brazil, present at Rio, held communication with those ports, and, after an interchange of congratulations with the presidents and officials of the several provinces, by a signal from the Rio headquarters all parties simultaneously sat to dine and toasted the success of the greatest enterprise that to-day exists in all Brazil. Other vessels of the company are now preparing to lay the remainder of the cable between St. Thomas, West Indies, and Para, which, it is expected, will be completed by May 7th, 1874, when there will be complete telegraphic communication with the United States, and thence to all parts of the world. Another line is projected and expected to be laid between Lisbon and Pernambuco within the year, thus opening direct communication with Europe.

Annual Meeting of the Atlantic and Pacific Telegraph Company.

THE Annual meeting of the Atlantic and Pacific Telegraph Company was held on Wednesday, the 26th inst., at the Executive offices of the Company in this City, and the following gentlemen were elected Trustees of the Company for the ensuing year. Messrs. Oliver Ames and John R. Duff, of Boston, Mass.; S. L. M. Barlow, George S. Bowdoin, George Bliss, Geo. H. Brown, H. G. Chapman, W. H. Clay, Sidney Dillon, John Duff, R. R. Graves, W. H. Guion, J. B. Hodgskin, C. P. Huntington, L. P. Morton, John H. Mortimer, G. G. Sampson, William W. Sherman, W. J. Syms, Henry M. Tabor, William R. Travers, John G. Vose, A. F. Wilmarth, New York; John Barker, Brooklyn, N. Y.; James Hendrick, Albany, N. Y.; N. C. Simons, Buffalo, N. Y.; Cheney Ames, Oswego, N. Y.; H. G. Hamilton, Rochester, N. Y.; Russell Wheeler, Utica, N. Y.; S. H. Marks, Lockport, N. Y.; W. W. Shippen, Hoboken, N. J.; C. S. Bushnell, New Haven,

Conn.; Herman D. Walbridge, Toledo, O.; R. M. Shoemaker, Cincinnati, O.; J. A. Devereaux, H. M. Flagler, Waldemar Otis, Cleveland, O.; C. B. Hammond, A. B. Meeker, Chicago, Ill.; and Emory Wendell, Detroit, Mich.

Foreign Telegraphic Notes.

THE directors of the Eastern Telegraph Company have announced an interim dividend of 2s. 6d. per share for the quarter ended September 30, 1873.

An interim dividend has been declared by the directors of the Eastern Extension Australasian and China Telegraph Company for the quarter ended September 30, 1873, at the rate of 6 per cent. per annum, or 3s. per share.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended January 3, 1874, was 284,788, an increase of 28,753 on the corresponding week of last year.

A dividend at the rate of 6 per cent. on the shares of the Anglo-American Telegraph Company is announced.

The *Evening Standard* says there is no truth in a recent report that the Telegraph Construction and Maintenance Company (Limited) are about to manufacture a light cable for the Anglo-American Telegraph Company for submersion between Great Britain and America. It is, however, probable that the 1,000 miles of cable owned by the latter company, and now on board the Great Eastern, will be utilized during the present year, with the addition of about 700 miles of new cable of the heaviest type—experience having demonstrated that this description of cable is the best and most durable.

Gibraltar has been for more than eighteen months connected with the telegraph system of Europe by means of the line between that city and San Roque. Up to the present time, however, the Spanish Government has permitted this line to be used only for telegraphing to places in Spain itself, objecting to the transmission of messages to other countries, on the ground that it would accept no responsibility except for messages deposited in its own telegraph offices. It is notified, however, that from the first of January the service of the Gibraltar telegraph, heretofore limited to Spain alone, will be extended to all parts of the world.

Admiral Sherard Osborn, C.B., F.R.S., has resigned the managing directorship of the Telegraph Construction and Maintenance Company in order to place himself at the disposal of the Admiralty, and is succeeded by Admiral Richards, C.B., F.R.S., who has filled the position of Hydrographer to the Navy for the last ten years. Admiral Osborn joined the Telegraph Construction Company in 1864, previous to the first contract for an Atlantic cable, and during his tenure of the managing directorship has successfully carried out contracts for upwards of 30,000 miles of cable, extending from Falmouth to Australia and America, and constituting a complete system of submarine telegraphy. He will still retain a seat at the board of the company, to whose utility and prosperity he has thus so long contributed.

The Eastern Telegraph Company's traffic receipts for the month of December, 1873, amounted to £35,238, and for the corresponding month of 1872 to £32,250, showing an increase of £2,988.

The Board of Supervision of the German Union Telegraph Company of Berlin have resolved to pay an interim dividend on account of the dividend due 1st May next, with 10s. 4d. per share of 100 thalers, or £15, at the German Bank of Berlin, London agency, 50 Old Broad street.

The West Indian Telegraphs.

THE Kingston, Jamaica, correspondent of the *New York Herald*, under date of Jan. 10th, writes:

"It has long been a scheme to connect the entire group of West India Islands by telegraph, and the British Government, through the Colonial Office, offered to grant some kind of subsidy or concession to any enterprising capitalists who should undertake to carry out the idea. The West Indian and Panama Company had at one time so far completed it that it was possible to telegraph to almost any part of Europe from these islands, and while they were about demanding their reward from the Government the cable between Colon and Jamaica was broken, thus severing the connection and shutting off communication. No sooner was the Colon cable repaired than the cable laid to the north end of Porto Rico became useless, thus again destroying the communication between here and St. Thomas. And, lastly, the Spanish authorities in Cuba have so far crippled the operations of the cable to Santiago and Batabano that it has been purely a waste of time to attempt to use it for transmitting messages *via* New York—five days being the time required for a single

word to reach your city. Notwithstanding all the accidents of the deep, and the unjust and untimely interference of the Dons, the Panama Company have determined to try again to make the circuit complete. A few days ago two large steamers, chartered by the Telegraph Construction and Maintenance Company, arrived at this port, having on board the material for the new Porto Rico cable. One of them, the Minia, had on board 648 miles of five eighths six strand wire. The Kangaroo carried fifteen miles of main cable, eighteen miles of intermediate and fourteen miles of shore end—the intermediate being about one inch and the shore end about one inch and three eighths in circumference.

The Minia, after having laid the present cable, will attempt to grapple and repair the wire now broken at some distance from Porto Rico, while the Kangaroo has to proceed to Martinique for the purpose of mending the Dominica wire, which has been sundered in about 1,000 fathoms of water.

The shore end of the new line will be laid, by about Tuesday next, the 13th inst., from Holland Bay, on the eastern extremity of Jamaica, to Ponce, on the south side of Porto Rico. The bottom, according to the soundings on the chart, appears to be uneven; in some places it is only about 600 fathoms, while only a short distance further on the leads went tumbling down the sides of immense hills to the depth of over 2,000 fathoms, showing that the bottom is mountainous and difficult to lay a wire on.

The wires, on being tested before leaving, were found to be in splendid condition, so that in all probability the enterprise will prove successful. The supervision of the work on behalf of the Panama Company has been entrusted to Mr. Theophilus Smith and a staff of three other electricians from the office of Sir Samuel Canning, while the contractors—the Construction Company—are represented by Mr F. Lucas and a special staff. Some little difficulties are expected in laying the shore end, for, though the British Government seems so anxious to have the West Indies connected by wires to the United States and Europe, their representative here declined to aid in the work by loaning a small steamer. Should the shore end be successfully laid by Tuesday, however, and the weather remain fine, the other end will have been laid at Ponce by about the 20th of January.

Ball at Tucson, A. T., to Celebrate Completion of the Military Telegraph Line to San Diego, Cal.

On Saturday, Dec. 5, 1873, a ball took place at Tucson, Arizona Territory, to celebrate the completion of the military telegraph line connecting Arizona with the telegraph system of the country at San Diego, California. The *Arizona Citizen*, which is published at Tucson, gives the following account of the affair:

"This affair was well attended and as well enjoyed. The evening was fine and the spirits of all present seemed finer. The dance opened about half past eight and continued to near twelve, when a fine supper was partaken of at Neugasa's restaurant. After eating and some drinking of coffee, champagne and other joy inspiring fluids, some remarks were made. Gov. Safford gave a concise and interesting history of the rise and progress of telegraphing, and commented on the mysterious wonder which it surely is to the mass of people even to this day. He paid proper tribute to Gen. Crook, and those under him, in its construction, and especially to Capt. G. F. Price, whose absence was regretted by all present, for to his energy and business tact the people of Arizona are much indebted for the entire completion of the line as contemplated with the small appropriation made by Congress; and the Governor very fitly referred to delegate McCormick's prompt action in securing the appropriation for the work. It is true that others high in authority recommended it, but for the opportune motion of delegate McCormick, and enforced by his excellent arguments in committee of the whole House of Representatives in Congress, there would have been no appropriation made. This is a little history in this connection which the people of Arizona should properly remember. After the Governor's remarks the proprietor of the *Citizen* informed those present of the contents of a news despatch just received from San Diego, which set forth that the administration of President Grant had wisely averted war with Spain upon honorable terms, which were briefly stated; the President's views on the postal telegraph and postal savings banks were also given as contained in the despatch fresh from Washington. Such late news was never before enjoyed at a supper in Tucson. Gen. E. A. Carr, of Camp Lowell, was called out, and he responded in some remarks complimentary to the citizens in general.

So far as we can learn, all present still feel that it was good to have been there, and rejoice that a large step towards removing our feeling of isolation from the hives of population and thronged business centres of our country had just been taken."

The Correspondence of "The Telegrapher."

Now that the prospect of the location of the American terminus of the Asiatic Telegraph Cable at this place begins to look like certainty, it is not out of place to mention the fact that the first public statement of the advantages of San Diego in that connection appeared in the columns of THE TELEGRAPHER, over the *nom de plume* of "Clix," and was from the pen of Mr. Wm. E. Smith, the manager of the Western Union Company's office in this city. The article was very extensively copied in the Eastern press at the time of its appearance.—*San Diego (Cal.) Union.*

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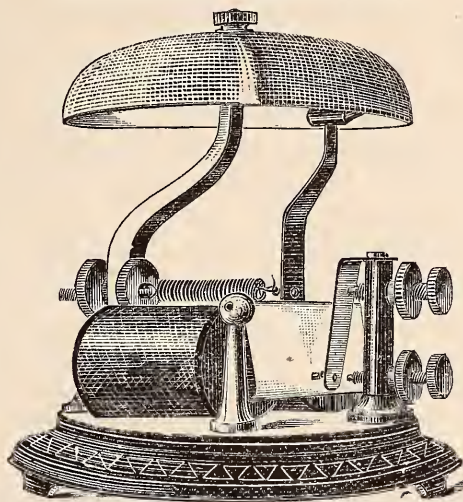
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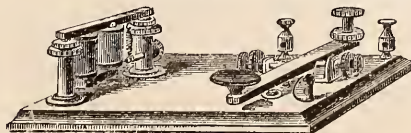
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Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

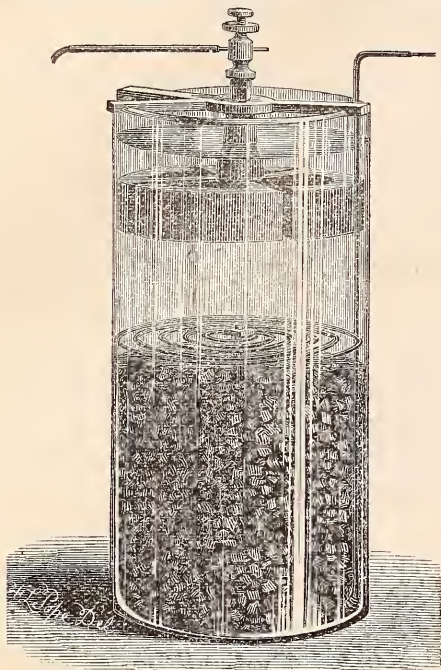
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionably stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. *Send for Circular.*

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

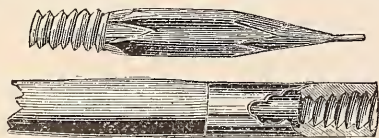
NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & CO. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.

W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

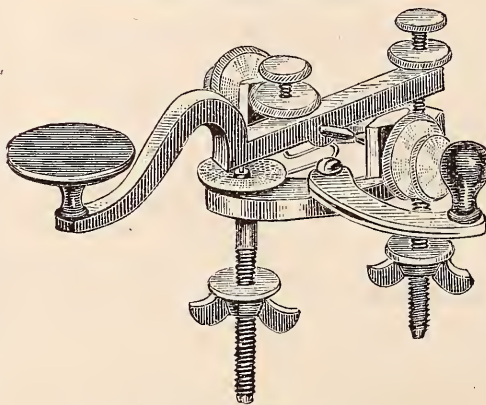
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41 Third ave., Chicago, Ill.

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47 Holliday Street,
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MANUFACTURERS OF
ELECTRICAL AND TELEGRAPH INSTRUMENTS
AND
Material of Every Description,
RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.
Nickel Plated Goods a Speciality.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,
Which has met with marked success.



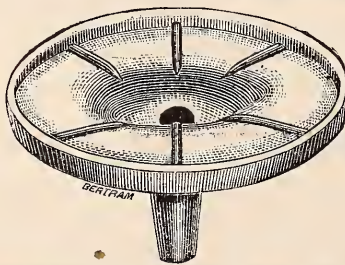
Price, \$5.50 plain; \$7 nickel plated.

The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK, }
Sept. 22d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,
A. S. BROWN, Manager.



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

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Designs for Switch Boards for special service furnished.

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AND
SHORT LINE TELEGRAPH APPARATUS.

A GREAT IMPROVEMENT

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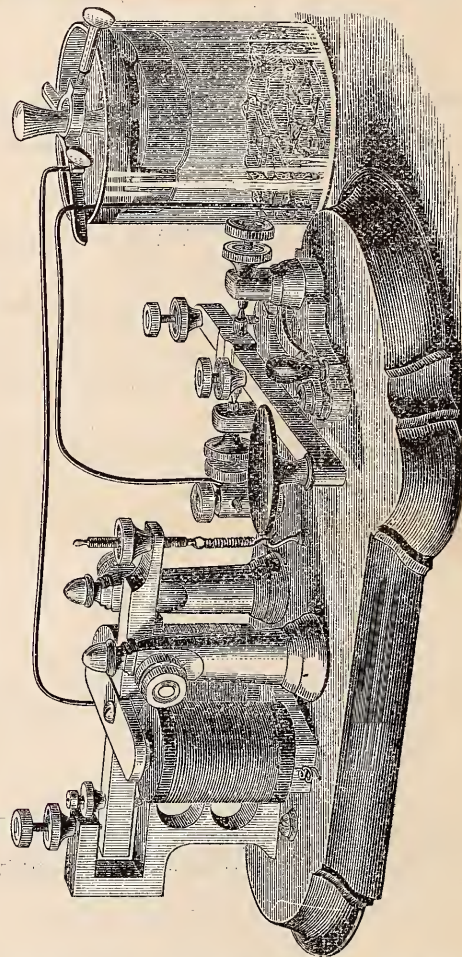
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AN EXCELLENT BOOK OF PRACTICAL INSTRUCTION IN TELEGRAPHY,

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The Instruments are full sized, complete in every respect. The Battery is a full sized first class Callaud cell, and the entire outfit has nothing about it which in any way resembles the many wretched affairs which have been extensively sold as Learners' Apparatus.



Great numbers of our "Champion Instruments" are in use upon short private lines, and upon City wires of Telegraph Companies, where they are giving the greatest satisfaction, on account of their very substantial make and excellent working qualities.

We guarantee them to be in every respect better than any form of Learners' Apparatus or Short Line Instruments ever offered to the public.

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Price of Single Instrument, good for one mile or less, without Battery..... \$8 50

Ornamental style ditto, with rubber covered coils, without Battery..... 10 00

Single Instrument, good for working a line from one to twelve miles..... 9 50

Ditto, ornamental, with rubber covered coils..... 11 00

Battery, per cell..... 1 50

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and Supplies of every description.

The Telegrapher

A Journal of Electrical Progress.

Vol. X.

New York, Saturday, February 7, 1874.

Whole No. 395

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ALSO, ON HAND AND FOR SALE,
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AND A FULL ASSORTMENT OF
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AT THE LOWEST PRICES.

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All kinds of Electrical Instruments
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All orders promptly filled, at reasonable prices.
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NOVELTY!
A SOUNDER of Entirely New Construction,
which gives with the usual amount of battery a very heavy and
clear sound.
SIZE FOR REGULAR OFFICES..... \$5 00
SMALL SIZE..... 3 50
LEARNERS' OUTFITS, with small size Sounder, Key,
Battery, Chemicals, Wire, Instruction Book, &c.,
all complete..... 7 50
Send for Circular.

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109 Court Street, Boston,
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DAY'S KERITE COVERED WIRE.

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PATENT INSULATED TELEGRAPH WIRES,
(PATENTED, NOVEMBER 18TH, 1873.)
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Having recently enlarged our factory, we are now prepared
to furnish at short notice any style and quantity of
BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes
the most durable, handsome and best insulated Braided Wire
manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires
covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Com-
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portion of the office wire used by them.
Sample Card and Price List furnished when requested.
Phillips' Wire can be had of

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- W. HOCKHAUSEN....."
- PATRICK BUNNELL & Co.....Philadelphia.
- WATTS & Co.....Baltimore.
- CHARLES WILLIAMS, JR.....Boston.
- THOMAS HALL....."
- GEORGE H. BLISS & Co.....Chicago.

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AMERICAN DISTRICT TELEGRAPH CO.,
NEW YORK, January 1st, 1874.
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used it exclusively for two years and consider it the best in the
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Respectfully,
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We warrant all Wire to be of the highest conductivity, tested
by our Galvanometer, which compares with the tests of the
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Parties who are in want of good
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can obtain them on favorable terms, and have them delivered
at any Lake Port between Oswego and Chicago, on the
opening of Navigation, by applying to
A. A. COLBY,
P. O. Box 1,376. **TORONTO, ONTARIO,**
CANADA.

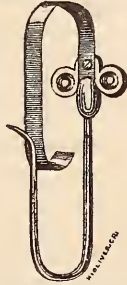
A NEW GALVANIC BATTERY.
Durability, Efficiency, and Economy of Expense
and Labor at last Secured.
THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.
The undersigned having secured the exclusive Agency for the
manufacture and sale of the
EAGLES METALLIC BATTERY,
now offer them to the public as the best Battery for Telegraphic
and other purposes yet devised.
The Battery cell is made of lead, and forms one pole of the
battery. Sulphate of copper is the only chemical required to be
used.
These Batteries have been fully tested during the last year,
although only recently offered for sale, and have proved to be
superior to any other as regards efficiency, economy and dura-
bility. When once set up they require no attention for from
four to six months, according to the service required of them.
Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for
running motors. Price, \$2.25.
On Locals, one No. 1 cell is used in place of two Daniells, at a
saving of nearly one half in cost.
No. 2 is a round cell, designed for main line. Price, \$2.
Descriptive circulars and price list forwarded upon applica-
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F. L. POPE & CO.,
(P. O. Box 5503.) **38 VESEY STREET, N. Y.**

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KEPT ON HAND, AND ORDERS FILLED BY
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109 Court Street, Boston,
AND BY THE
WESTERN ELECTRIC MANUFACTURING CO.,
AGENTS FOR THE UNITED STATES,
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WALLACE & SONS,
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BRASS, COPPER & GERMAN SILVER WIRE.
Also, BRASS, COPPER and GERMAN SILVER,
in the Roll and Sheet.
We make the manufacture of Electric Wire a specialty—
especially the finer sizes of Copper for conduction, and German
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the same in every instance to be superior to that of any other
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Late Assistant Examiner of Electrical and Telegraphic Apparatus,
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SOLICITOR OF PATENTS,
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SECURITY MESSAGE HOOK.



PATENT APPLIED FOR.

The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.

Price.....30 cents each.
" per dozen.....\$3.00.

Liberal terms to the trade.

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General Agents.

SECOND-HAND RELAYS.

A large lot of well polished and good working Relays for sale very cheap; also, several sets of

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in perfect order, at a nominal price.

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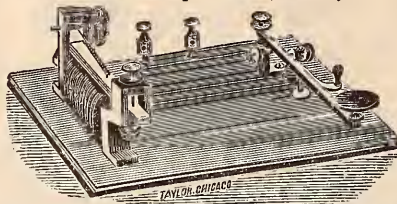
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(Patented April 16th, 1872.)



This is a *bona fide* Telegraph Instrument, with a full sized Trunnion Lever Key, with Friction Circuit Closer and a Pony Sounder, both on same base.

The Battery used is HILL'S Patent Gravity Battery, the most constant and economical in use.

With each Instrument is furnished

ONE CUP OF BATTERY,

TWO YARDS OFFICE WIRE,

ONE PACKAGE BLUE VITRIOL,

ONE PACKAGE SULPHATE ZINC,

and a "Manual of the Telegraph," for the instruction of beginners. This is a sufficient outfit for the student.

In operating a short line there will only be required, in addition to the above, more cups of battery, according to the length of line.

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A COMPLETE OUTFIT FOR A TELEGRAPH OFFICE,
Seven Dollars and Fifty Cents.

Two Sets, complete.....\$14 50

Sounder and Key only.....6 50

" " with Cut-out and Lightning Arrester... 7 50

We will pay expressage on Amateur Outfits when price is remitted in Advance.

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There are some *Six Hundred and Twenty-five* Illustrations in the Edition of 1859, and the present coming Edition will contain at least *One Thousand*, descriptive of the latest improvements.

At present it is my design to issue two Volumes, containing about 600 pages each, separating the Historical from the Operative.

I will thank any one for information suitable for such a work. Would like drawings and description of apparatuses.

Respectfully,

TAL P. SHAFFNER,

78 and 80 Broadway,

NEW YORK.

MODERN PRACTICE OF THE ELEC-
TRIC TELEGRAPH.

A HAND-BOOK

FOR

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By **FRANK L. POPE.**

Seventh Edition, Revised and Enlarged by the addition of 40 pages of New Matter on

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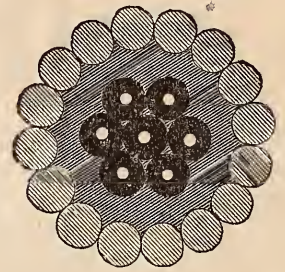
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Has also on hand, and makes to order,

SUBMARINE CABLES, OFFICE CABLES, AND INSULATED
WIRES OF EVERY VARIETY,

FOR

TELEGRAPH, UNDERGROUND AND ELECTRIC USE.

Fuse Wires, Leading and Connecting Wires for SUBMARINE
and MINING PURPOSES.

Also, a NEW COMPOUND (thoroughly tested) for underground
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Cotton, Linen, Silk and Fibre covered Wires for

MAGNET AND OFFICE USE,

of any pattern or style.

OFFICE WIRES,

Cotton and Gutta Percha covered, with any number of conductors
required.

Gutta Percha and Cotton covered Wires for HOTEL ANNUN-
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BLASTING AND MINING PURPOSES,

In every variety desired.

As an Insulation for Telegraph Cables and Electric Conductors
GUTTA PERCHA has been universally adopted by all scientific and
practical Electricians and Manufacturers of Telegraph Cables and
Wires in this country and Europe, and has sustained, with in-
creasing superiority in the practical test of over twenty-five
years' general use.

The PROPRIETOR will guarantee, to all parties purchasing

SUBMARINE TELEGRAPH CABLES,

to make and deliver at his Factory any style of Cable, Insulated
with Gutta Percha, as low as they can import Cable of the same
style and quality, and in half the time required to import them.

CABLES OF ONE MILE OR LESS manufactured and deli-
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ORDERS RECEIVED AT THE FACTORY.

Messrs. L. G. TILLOTSON & CO.,

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have been appointed by me GENERAL AGENTS for the sale of
any Telegraph Cable or Wire manufactured at the Works in New
York, at Factory Prices, delivered in New York.

JOHN THORNLEY, 503 Chestnut St., Philadelphia,

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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, FEBRUARY 7, 1874.

VOL. X. WHOLE No. 395.

[From *The Ghost*.]

Telegraphic Lays.

It was thought some years ago, when a celebrated blacking house in the City of London advertised "We keeps a poet," that blacking was tending upward, and that the makers of that convenient compound were enterprising who could afford to make a raid into the realm of the Muses, and keep up unflinching chase of the Parnassian heights, until a full fledged singer was overtaken and brought to London to chant the praise of prosaic blacking. But in this enlightened day every blacking establishment might employ a versifier, without the trouble even of invading the enchanted enclosure of the Nine, for their name is legion who slip astride their Pegasus, and cavort about the arena of questionable verse in a manner as wayward and free as that which characterized Mr. Wegg, who, as all will remember, professionally "declined and fell, and, in a friendly way, dropped into poetry" for the edification of good Mr. and Mrs. Boffin. The editor of this veracious chronicle finds that in our own midst we have a number who write lines of considerable merit, but so numerous are his friends who have

"Sighed o'er Delphi's long deserted shrine,"

that he will not attempt to give the names of these "celebrated composers," lest he may make some errors in fixing the authorship. In a little book which lies before us we find the following:

In theory the city line
May be considered very fine;
But to be gobbled every day,
And from my post be sent away,
And shifted till I'm tired, I vow,
A victim of caprice, I "swow,"
Is not so fine, you'll all allow;
But to imperious Fate I bow.

Though my young years do count but few,
It seems as if the Wandering Jew
Had in me found his modern mate—
For ever has it been my fate,
Not only eight days out of nine
To wander 'bout the city line,
But on the ninth to wander back,
And at "En" to take a crack.

Now Downer orders me on six—
'Tis always in a fearful mix—
And then I'm sent on fifty-one,
A place I love to rest upon;
But Fate conspires, and soon I pine
Again upon the city line.

And so it's been "from childhood's hour,"
"I never loved a tree or flower"
But off I wandered like a star,
Always "so near and yet so far."

A night man, who worked on the "Eries" before Mr. Smith went on the "South," tells his experience in the following manner:

"SUBBING" ON THE WEST.

When you work upon the "West,"
Oh! minions of the night,
Have a care for Smith, the chief.
If you tend to biz, however,
You are sure to be all right;
But don't go prowling round,
Or you'll surely come to grief.

One dingy afternoon I engaged myself to serve
For one Harris, who with Erie No. 7 had to do;
And I strolled about the room my spirits to preserve,
And passed my time away in "chinning" one or two.

But no matter where I went I met Gerrit everywhere;
And he smiled a funny way, and propounded me this query,
Till I "tumbled to myself," as our friend Melotte would say,
"Let's see, how's this, ain't you working 7 Erie?"

Yes, ye minions of the night,
When you "scoop" in the broad day,
Skin your orb for Smith, the chief.
If you tend to biz, however,
You are sure to be all right,
But don't go prowling round,
Else "Ain't you—Erie"—grief.

From the "Line Men's Book" for last year we take the following:

When men are sent out on the wires
Armed with a coll, and spurs and pliers,
With care the chiefs will, in this tone,
Note when they start, and when come home.

If'er they should o'erstay their time,
And make their claims they had to climb
The largest pole within the town,
The chiefs will also note this down.

But if the fragrance of the cup
Should spoil their tale of climbing up,
The same will on this record go,
That Captain McIntosh may know.

A branch office man amused himself on New Year's Day, which he put in at "No. 145," evolving the appended, which was found on the back of a blank on the table where he had been put down "to do his working."

This winsome, gladsome, gay New Year,
Sans whiskey, brandy, wine or beer,
Is quickly passing while we're here
Hard working.

I know this life is one of woe—
At least I've always found it so—
But yet I cannot blame the Co.
For working.

For if I had in seventy-three
Saved spondulix sufficiently,
I could have hired a sub, you see,
To do my working.

But this is but a vain regret:
Yet during seventy-four, you bet,
I'll steadily keep out of debt
And save my money.

In parting with his desk diary an operator waxes sentimental, and, with a lingering, longing look, he relinquishes it with the following very creditable verse:

Adieu, old book! thy work is done!
Thy record of this busy wire
Is all complete, and on my lyre
A parting song I sing. Adieu!
Adieu forever that long, endless day
Which brings no hope! Away! away!
And now again farewell;
"And if forever, then forever
Fare thee well."

Here is a little one for a cent, which was floating around at Christmas:

To add to the joy of your Christmas bliss
I hereby send you an electric kiss.
May it gladden your heart and brighten your eye
Till I exchange it for a real one bye-and-bye.

[From the *Iron Age*.]

Automatic Semaphore R. R. Signals.

To the Editor of the *Iron Age*.

THE article describing Robinson's Electric Railroad Signals, in your paper of January 8th, contains some statements calculated to convey an erroneous impression in regard to the origin of the system of operating automatic semaphoric signals, by making use of the ordinary rails of the track as electric conductors. After giving three distinct and very excellent reasons why the so-called wire systems previously in use "are extremely limited in their functions, and may, under certain circumstances, show a safety signal when the danger actually exists which they are designed to avert," you add: "Mr. Robinson early recognized the above serious objections as inseparable from the wire system of signaling, and his efforts to overcome them have resulted in the present rail system."

In reply to this statement I would say that in February, 1870, I was employed by Mr. A. E. Beach, of the *Scientific American*, to arrange an electric signaling apparatus for the Broadway Pneumatic Railroad. The car was driven by a stationary blowing engine, and it was necessary to automatically give a signal to the engineer when the car reached the remote end of the tunnel, so that he might reverse the blower. I connected the battery to the rails in such a manner that the wheels of the car would complete the circuit and operate an electric bell during its passage over a certain section of the track. This apparatus was in operation for some months, and was seen by hundreds of people. It subsequently occurred to me that the same principle might be applied to ordinary railroads, and I found by calculation that it ought to be practical to convey an electric current through a line of fish-jointed rails for at least two or three miles, even in wet weather. I tested this idea in the summer of 1870, on the line of the New Jersey Railroad, for a distance of between one and two miles, and proved by actual experiment that a strong current could be conveyed at least that distance, and a magnet operated without serious difficulty. Having satisfied myself in regard to this fundamental point, the arranging of a signal to be controlled by the magnet was obviously a matter of no great difficulty. I was then actively engaged in other business, which I disposed of in May, 1871, in order to develop my proposed system of signaling. I worked out the details of my plan, and, on the 19th of September, 1871, I filed an application for a U. S. patent, in which I proposed to use the rails in sections of a mile or more in length—of the practicability of which my earlier experiments had satisfied me. By November I had made a successful experiment on a New England railroad, where the apparatus remained for some months, and was examined by a considerable number of people. In

this experiment I employed the rail circuit in combination with both a stationary alarm and a semaphoric signal, and, so far as I can ascertain, I was the first to do this.

It seems quite certain that up to about this time Mr. Robinson had not the slightest conception even of the possibility of operating signals successfully by rail circuit; for, in an article published over his own signature in the *American Artisan* of September 6, 1871, he says: "Albert Horwood received a patent in 1861 for a device in which he used three insulated rails, about as long as ordinary rails; these he placed longitudinally between the rails of the track. Two upright bars on the engine came in contact with these rails, closed the circuit, and operated the instruments at the station. It was only necessary that a careless laborer should connect two of the insulated rails by a shovel full of moist earth, or that a mischievous boy should place a wet stick across them, in order to operate the instruments at the station. This, of course, is an insurmountable difficulty in this invention."

If Mr. Robinson at this time supposed that a single wet stick laid across the rails would operate the instrument, it is reasonable to suppose that the idea of operating a signal through a mile of rails, connected together by 2,640 "wet sticks"—which is actually the case in the rail system on a rainy day—must have appeared to him so wildly absurd as to be utterly unworthy of consideration! Even so late as November, 1871, Mr. Robinson was still at work endeavoring to perfect his wire system and lever circuit closers, after my application for a patent on the rail circuit had been before the office for nearly two months. But on the 6th of December, 1871, after accounts of my experiments had been published, and had become a matter of common report in railroad circles, Mr. Robinson also applied for a patent on the rail circuit, differing from mine only in the arrangement of the connections, so that the magnet would be unmade instead of made by the passage of the train. My patent was granted July 16, 1872, and reissued October 21, 1873, and covers broadly the combinations above referred to. I certainly have no desire to detract from any credit that may be justly due Mr. Robinson; but, as a matter of justice to myself, it seems proper to make public the above statement of facts.

Very truly yours,
FRANK L. POPE,
Engineer Electric R. R. Signal Co.,
38 Vesey street, N. Y.

January, 23, 1874.

A Noble Opportunity Lost.

We have now in progress, in the City of New York and elsewhere, several massive and imposing structures, which, though belonging to private individuals or corporations, may, nevertheless, from their position and the objects for which they are intended, be justly regarded as public buildings. Prominent amongst these is the building which is now being erected at the corner of Dey street and Broadway, in this city, for the use of the Western Union Telegraph Company. In its proportions and the massiveness which characterizes every part, it promises to be one of the finest structures in the city. There is no sham work about the materials or the mode in which they are put together. Some idea may be formed of its size when we say that it is very nearly one half larger than the well known building of the Equitable Life Insurance Company; that there are ten stories, the height to the top of the pavilion roof being 174 feet, while the top of the clock tower, which, by the way, is to be accessible, is 216 feet above the level of the sidewalk. As a means of comparison, we may also state that the height of the spire of Trinity Church is 286 feet. The material is granite, brick and iron; and, from the well known wealth and liberality of the company, it is to be presumed that the architect has been untrammelled by any considerations of mere cost. The object was to produce a structure in which might be transacted the business of one of the richest and most important corporations in this country or in the world—a corporation whose relations to the public are as intimate and as extended as those of the post-office itself; and whose functions, whether under Government control or in private hands, can never be dispensed with. It does not require any elaborate argument, therefore, to show that a building suited practically and aesthetically to the purposes of such a corporation should present a massive and imposing appearance; that it should depend for its effect rather upon a grand simplicity than upon intricate tracery, and that the colors should be quiet and subdued. And now what has the architect given us? Something which can be compared to no other object so well as to a gigantic barber's pole, with horizontal instead of diagonal stripes! Every passer by who possesses the slightest degree of correct taste, must be disgusted with the bizarre appearance presented by this structure, and must regret beyond measure the loss of the fine opportunity that was there presented for the erection of a building that would have done us credit.—*Industrial Monthly*.

Decision of the Postmaster General Regarding Government Messages.

POST-OFFICE DEPARTMENT,
WASHINGTON, D. C., January 16, 1874.

SIR: Your letter of the 13th instant states that in consequence of a difference in construction of the rules established by this department, relative to the computation of distances, your accounts for Government messages have in some cases been subject to reduction; that messages between St. Paul and points on the Plains have to go by way of Chicago, and thence to Omaha and destination, involving repetitions, while the post route may be nearly direct; that all messages for the Pacific Coast have been sent to San Francisco, and re- sent from that point; that you charge from Washington to San Francisco 3,123 miles, and from San Francisco to San Diego 517 miles, making 3,640 miles or 15 circuits, while you are allowed only for the direct distance from Washington to San Diego, 3,199 miles, or 13 circuits; and inquires whether it was the design of the Department to limit the compensation of telegraph companies to air-line distances.

In section second of the act approved July 24th, 1866, being the act under which the rates of telegraphing are fixed by the department, it is enacted that telegraphic communications between the several departments of the Government and its officers and agents, shall "in their transmission over the lines of said companies" have priority, etc. This language itself defines the route; that is, that it is to be "over the lines of the companies;" and, consequently, excludes the idea of air line distances or routes over which there are no telegraph lines. I consider, therefore, that the companies may properly charge for the distance actually traversed by the message, although the mail route may be more direct. While the direct distance from Washington to San Diego is less than that by way of San Francisco, the latter route is the usual course of the mail, for the reason that it is the most convenient and expeditious in point of time. While I think it is right that the companies should charge for the distance over their lines, I hold that where there are two lines between the same points they are not to be allowed to subject the Government to unnecessary expense by charging for the greater distance.

Very respectfully,
Your ob't servant,
(Signed), JNO. A. J. CRESWELL,
Postmaster General.

LEONARD WHITNEY, Esq.,
Manager Western Union Telegraph Co.,
Washington, D. C.

The Western Union Chicago Office.

THE City of Chicago has 75 miles of poles and 700 miles of wire (of Western Union proper) within the metropolitan limits, with 68 branch offices—28 regular Western Union and 40 Metropolitan. The main offices occupy a large portion of the block on the southwest corner of Washington and La Salle streets. In the basement are the District Superintendent's offices and the receiving department; on the second floor the General Superintendent's office and the office of the Associated Press; and the entire fifth floor, one hundred feet square, is occupied by the operating department. The wires are brought into the building on a new plan—being carried from the poles above the neighboring blocks to a central tower, through which they drop down in a circular cluster to the operating room. They already number 250, and the tower has a capacity for 750 wires. The wires are for the most part steel covered with copper. On entering the tower they strike the "lightning arrester," by which the atmospheric electricity is carried off to the ground. The wires are exposed in their whole length after entering the building, facilitating changes and repairs. Attached to each wire is a metallic tag, corresponding to another on the corner poles, giving the title of the wire. There are connected with the operating department two battery rooms, which the wires enter in a cluster. In the local battery room there are two jars to each instrument worked, giving increased force and louder sound, enabling the operator to read by ear. In the main battery room are five separate batteries—the largest of 60 cups, the smallest of 25—from which all the wires are worked. The transition from the quiet of the battery department to the din of the great operating room is no more striking to the ear than impressive to the imagination. This room is never closed; every moment, all the year round, and from year to year, the scores of instruments are vocal with their sign language, and the tones of each are lost in the incessant hum of all. Here are ninety-five employes, busy day and night—about fifty constituting the operating day force—these little instruments, making audible the omnipresence of this electric potency; through them day uttereth speech unto day, and night unto night showeth forth knowledge, until now there is no language or land where their voice is not heard.

The "ends of the earth" are here literally brought together, and here meet and mingle the thoughts and purposes of men separated by all the oceans and continents of the earth.—*Chicago Railway Review.*

The Electric Telegraph on the Gold Coast, Africa.

A LARGE number of men, of all colors, castes and creeds, are employed under the Royal Engineers in the construction of the land telegraph lines on the Gold Coast. Wherever it is practicable trees are substituted for telegraph posts without cutting them down. By means of the light wire and small insulators sent out from Henley's Telegraph Factory at North Woolwich, these men, with no other tools than a light ladder, large gimlet, a handsaw and axe, can complete six miles of line per day when the way is tolerably clear through the bush. The number of insulators and tree posts per mile varies according to the nature of the ground. The average on level ground is eighteen intermediate and three straining posts per mile, which makes a span of eighty-four yards, and on hilly and difficult ground there are as many as twenty-six posts to the mile, and, in exceptional instances, there are spans of two hundred yards. The telegraph apparatus employed in the Gold Coast expedition against the Ashantees is the invention of Sir Charles Wheatstone, and is contained in a compact box, thirteen inches long, eight inches broad and seven inches deep, the weight of the whole being under twenty-five pounds. The electric power is derived from a permanent magnet within the instrument, a constant series of currents from which is obtained by a rotation of a small iron armature placed before its poles and turned by a handle in front. The signals are made by successive depressions of lettered finger keys arranged round the dial plate. By means of these instruments camp and field messages can be transmitted, at the rate of twenty words per minute, a distance of one hundred or two hundred miles. The object in erecting the field telegraph is that of making known the enemy's position or numerical strength, to order arms and reinforcements from distant stations, and to control any military and strategic movements found necessary in the war on the Gold Coast with the Ashantees. It is the first time field telegraphy has been employed by the English in actual warfare.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., Feb. 4.

TO THE EDITOR OF THE TELEGRAPHER.

OUR friend Mr. Gardner T. Hubbard was afforded an opportunity to reply to the arguments of Mr. Orton before the Senate Post-office Committee last week, and repeated his arguments and statistics in favor of his scheme for establishing a private telegraph monopoly in company with the Government, with which the "constant reader" of THE TELEGRAPHER is so familiar. It is hardly worth while to reproduce them at this time. The committees of Congress and the public are so thoroughly weary of the subject that the recent discussion has attracted very little attention here, as is manifest from the fact that although the hearings before the Senate Committee were public, the newspaper correspondents and reporters did not honor them with their presence, and they have been accorded the briefest possible notice in the reports of the Associated Press.

Our amiable friend Gohright, the manager of the Associated Press bureau here, despite his desire to accommodate all who have "items" to communicate, looks glum when Hubbard or the postal telegraph are mentioned, and would, no doubt, with characteristic piety, were it not for his repugnance to saying or doing anything that could give offence, pray "Good Lord deliver me" from any further knowledge or mention of this threadbare subject. As for the other correspondents and reporters, they quietly ignore the whole matter, and if it is brought to their notice, are compelled at once to leave in pursuit of an item or an "interview" which cannot be neglected for a moment. It must be confessed that your correspondent, and, I doubt not, most of your readers, have a similar feeling, but THE TELEGRAPHER, as a telegraphic journal, must be kept informed on all matters pertaining to the art or business.

The Senate yesterday adopted a resolution authorizing the presiding officer to appoint an operator for the Senate wing of the Capitol for the departmental telegraph line.

In my communication of January 12th it was stated that arrangements had been made for the transfer to the Western Union Telegraph Company of all the weather reports, etc., of the Signal Bureau. This arrangement has been consummated, and from and after last evening this business, which has heretofore been divided between the Western Union and competing lines, will all be done over the former. The consolidation of the Pacific and Atlantic lines broke up some of the circuits as previously established, and made it very inconvenient for the bureau to transact its business, and interfered with the prompt transmission of some of the reports, so that the change was rather forced upon the chief signal officer. This is another demonstration of the necessity for a consolidation of the lines and interests competing with the Western Union into one organization, and the extension of the system until it becomes really national, and able to compete effectively for the telegraph business of the country. CAPITOL.

An Oregon Telegrapher's Trip.

ALBANY, OREGON, January 16.

TO THE EDITOR OF THE TELEGRAPHER.

"A LONG time I no see you," as our Mongolian neighbors say.

Since our last we have been off on a "trip for our health," over the Puget Sound country, and if the items enclosed are of any interest to the readers of our paper, they are welcome to them.

January 1st we left Albany and struck down the R. R. to Portland, thence down the mighty "River of the West" for Kalem, W. T., the headquarters of the Pacific Division of the Northern Pacific R. R.

Arriving there in company with Mr. Sheridan, W. U operator, we found friend Fagan in charge of the R. R. office. We gently intimated that we were not averse to accepting a pass to Tacoma (the terminus) and return. He opened his heart, and in a short time we were in possession of two pieces of paper that are a "g-o-o-d thing to travel on."

Leaving Kalem we started down the bank of the Columbia River, and thence up the Cowlitz through a country that could with the greatest of propriety be called well wooded, watered, and very "billy." The road is a splendid piece of work, but how it is to be supported from the country around and adjoining is more than we can imagine.

A sixty mile ride brought us out into the first prairie we had seen since leaving Kalem, and six miles more to Tenino, the point we "lit out" at, as we wanted to visit Olympia, the capital of the Territory.

Horror! At Tenino we found that to reach Olympia a stage ride of sixteen miles awaited us. We started out in the most awful snow storm I have ever seen on this coast, and, to make it worse, it was freezing hard. This was nice for Oregonians who knew little or nothing about snow and ice!

Olympia was finally reached after four hours' ride over a terrible mountain road. This is a very pretty little town of 2,500 inhabitants. It is situated at Budd's Inlet, an arm of Puget Sound, one and a half miles below the extreme head of tide water. There is a great deal of business done here. Stepping into a telegraph office we found Mr. H. H. Pitts, a pleasant gentleman and first class telegrapher, in charge.

Sunday morning at 8 o'clock, by the steamer Zephyr we started down the Sound—giving up our proposed trip to Victoria and British Columbia on account of severe weather. After visiting Steilacoom, the oldest town in the territory, we reached Tacoma, the "terminus" of the N. P. R., so much talked about, where we take the first through passenger train from Puget Sound to the Columbia River.

Here on Puget Sound is to be found some of the largest saw mills in the world, cutting from 60,000 to 150,000 feet of lumber each day. Ships are continually loading here for all parts of the world. The Tacoma mills keep in active operation, for their own use, a line of telegraph from Tacoma to Steilacoom, where it connects with the through wire. The Puget Sound Telegraph Company was organized for the purpose of connecting all the different mills on the Sound and local business, and is doing well.

There is bound to be a big city somewhere on this Sound, as the water is very deep, averaging from 60 to 200 feet up to within 20 or 30 feet of the shore; and, as it is protected by hills from high winds, it makes the finest harbor known; and, for size, all the ships that sail the seas could be put inside this harbor. If any of our eastern operators want to "invest," let them watch the progress of things, and put their money in the *to be* city of the United States—so the Puget Sound people say.

At Tacoma the Railroad Company have built a large depot, buildings, offices and hotel. I understand that in the spring the headquarters will be moved to Tacoma from Kalem.

Our old friend, J. B. Whittlesey, is manager, and is managing to exist on a "hundred a month." "Whit" is an old timer, and looks just as he did years ago.

when he used to give "Webfoot" H—lifax for breaking in on press, when the aforesaid "Webfoot" was "beginning" on the old string from Portland to San Francisco.

A splendid double wire line has been thoroughly built from Kalemo to Tacoma, under the supervision of Mr. F. W. Lamb, formerly Superintendent of the fourth district of the W. U. Telegraph Company.

The following are the operators on the N. P. R. R.: Kalemo—C. E. Fagan, chief operator and Superintendent, *pro tem.*—no train despatcher or Superintendent having been appointed as yet. Cowlitz, Edward Valiere, agent and operator; Oleque, Edward Stevens, agent and operator; Tenino, Chas. C. Hogue, agent and operator; and last, but not least in size or ability, J. B. Whittlesey, Tacoma.

For favors received on this little run we desire to return our sincere and heartfelt thanks to Chas. D. Faling, Superintendent Telegraph, O. & C. R. R., Portland, Oregon; C. E. Fagan, chief operator, and Gen'l J. W. Sprague, Gen'l Supt. N. P. R. R.; C. C. Hogue, Tenino, and J. B. Whittlesey, Tacoma.

Boys, as ye have done unto me so shall it be done unto you if you ever come my way; and the remembrance of your kindness will ever be fresh in the memory of

WEBFOOT.

Inspection of the Arizona Military Telegraph Line.—A New Consolidated Office.

SAN DIEGO, CAL., Jan. 10.

TO THE EDITOR OF THE TELEGRAPHER.

THE pressure of business has been so great lately as to interfere with my purpose of keeping THE TELEGRAPHER posted in regard to telegraph matters in this section of the country. At length I have been able to find a few moments of leisure which I can devote to you.

Capt. George F. Price, of the fifth Cavalry, U. S. A., is now on a tour of inspection of the new military line connecting Arizona with San Diego.

The offices of the Western Union and United States military telegraphs here have been consolidated, and placed under the management of Mr. W. E. Smith. A handsome office has been fitted up for their joint occupancy. The receiving and operating room, are all in one, with a sleeping room in the rear, and another room for the battery, near the latter.

The operating room is fitted up with Boston tables, with the wires run under the floor, so as to be out of the way and out of sight. Upon one wall of the operating room there is a splendid chromo (thirty-six by thirty inches) of Stanley's Indian Telegraph, which represents a scene near Gila Bend, Arizona Territory. On a high pedestal of rocks on the eastern bank of the river two Apache chiefs are seen—one signaling with a flaming, smoking torch, while the other watches for the reply seen curling up in the dim distance. The air in Arizona is so clear that these signals can be seen for a long distance; in fact, one of the main causes of defeat of the United States soldiers operating against the Apaches has been the information of their coming conveyed by this system of visual telegraphy. The new Morse telegraph line has rendered this system of little use to the Indians in the future. With the aid of the telegraph we will be able to keep peace in the rich but Apache cursed territory of Arizona.

Upon another wall is exhibited a handsome lithograph of the new Western Union New York office, now in course of construction, surmounted by a bracket supporting the bust of Prof. Morse. Upon the other walls are displayed a view of the San Francisco Western Union office, several locomotives of Eastern railroads, etc., pleasant reminiscences of old times to the employés and others.

Altogether it is the neatest and most completely fitted up telegraph office I ever saw—combining the conveniences and improvements which have been from time to time introduced into different offices. It is a comfortable and attractive office for the employés as well as the public, and calculated to make the former contented, and willing to remain permanently where they are so well situated.

The citizens generally are greatly pleased with the improvement, and consider it a credit to their young but important and growing city. More anon.

CLIX.

How Two R. R. Telegraph Supt's Conspired to Fleece a Victim.

NEWARK, N. J., Jan. 31.

TO THE EDITOR OF THE TELEGRAPHER.

THE communication from "Centripetal," in your last issue, and your editorial comments upon the "Conspiracy to Oppress Telegraph Employés," brings to mind a sample of the policy pursued by the Superintendent of an important railroad telegraph line in this vicinity.

At the junction of the Central Railroad of New Jersey

with the Delaware, Lackawanna and Western R. R. an operator was employed who performed joint duties for both companies, and drew a portion of his salary from each. The Central R. R. paid him \$25 per month, and the D. L. & W. \$35, making a grand total of \$60 for thirty days, of twelve hours each. The former operator retired from this lucrative position after saving up a sufficient competency to provide against want in his old age. But his successor being in more of a hurry to get rich, endeavored to secure an advance of \$10 per month from the Central R. R. His avarice hastened his downfall, for it brought to the immediate attention of the Superintendent the fact that his salary was even then \$10 above the standard adopted for men in his position. In order to restore the equilibrium his monthly stipend was reduced to \$20 per month on the part of the Central R. R., and the Supt's doubtless thought that he could easily induce the Supt of the D. L. and W. to cut away a corresponding slice from the salary paid by that Company. In this he was for a time unsuccessful, but by continued perseverance, worthy of a better cause, he eventually succeeded beyond his expectations, the D. L. and W. Co. reducing his pay to \$25, leaving him the munificent sum of \$45 per month. It is a source of gratification to be able to state that the young man shortly after secured a position on another line, and has thus escaped from the combination which endeavored to swindle him out of \$15 per month.

I hope you will not overlook the fact that in this instance it was only through the connivance of the officials of two different companies that this result was accomplished. One of these worthies acts also as an assistant to D. H. Bates, and hereafter, when you have occasion to work out a problem of meanness, you can adopt as your formula, Eckert, Bates, Fuller—mean, meaner, meanest.

REDLIGHT.

Topics of General Telegraphic Interest Discussed.

TO THE EDITOR OF THE TELEGRAPHER.

THE correspondence columns of THE TELEGRAPHER are read by myself, and probably by most of those who receive the paper, with great interest, and although the ideas of some of the writers are crude and not well considered, they are all valuable as reflecting the opinions and sentiments of those practically engaged in telegraphic pursuits. The policy of the paper in giving to all an opportunity to be heard, and to make known their views and sentiments, is undoubtedly the true one, and is one of the reasons for its popularity among the practical telegraphers of the country.

It must be confessed that lately I have not taken as much interest as formerly in the discussion of the Telegraphers' Association question, as there seems to be little that is new to be said, and no indication of any real purpose or determination to establish a new organization. Until some flagrant and general system of oppression of the fraternity is developed, it is not probable that any effective movement in that direction can be successfully made. On the abstract proposition that such an organization or association, carefully and intelligently devised, would be advantageous to the employés and employers, there is, probably, among the practical thinking members of the fraternity, little diversity of opinion; but this seems not likely, for the present at least, to take practical shape. So long as no one is prepared to take the lead in such an organization, I, for one, cannot see any prospect of its being established.

The matter of insufficient and inadequate compensation of telegraphic employés has occupied, I would be afraid to estimate how many columns of THE TELEGRAPHER.

It seems to me, however, that most of those who write upon this subject take a very partial and limited view of it, and do not usually generalize upon it at all. They seem to look at and consider only individual cases, and that usually their own, and do not take into account the fact that in averaging compensation of employés telegraph managers have many things to consider. While it is true that in many cases telegraph employés are insufficiently compensated, in more the individuals concerned receive much more than they could obtain in other employments. Telegraphy, of late years at least, has not apparently proved very remunerative to the investors in telegraph property, and it is a question whether commercial telegraph companies can afford to pay higher salaries than they do. The trouble, it appears to me, is not that the amount expended in telegraphic salaries is inadequate, but that it is not properly apportioned, some receiving more than their ability and proficiency entitle them to, while others are underpaid. One of the principal advantages to be derived from a telegraphic association would be, by cooperation between employés and managers, to classify situations, operators and salaries, so that they should be more properly arranged than at present.

There are other subjects which have been and are being discussed in the columns of THE TELEGRAPHER and among operators which I should like to consider, but probably sufficient space has been occupied for the

present. If this communication is favorably received, I may hereafter offer you some further considerations on topics of general telegraphic interest for publication.

PRACTICAL TELEGRAPHER.

Telegraphers Not so Bad as Represented.

TO THE EDITOR OF THE TELEGRAPHER.

AS I HAVE just finished reading THE TELEGRAPHER, and turn back the leaves, my eye falls upon the communication with the signature of "Nettie Bronson," and of course, I have to read it again. I heard it said by a brother operator last night that he should not be much surprised if that was a fictitious name for some young operator that wanted to be a girl, but could not, so he assumes a girl's name. Now, if the writer of these communications is truly a girl, I look upon them with admiration, and have no doubt but what I would also admire the bearer of that name if I could see her. If the writer is some male operator with that signature, he is very low, in my estimation, and is unworthy of being recognized by his brother operators; but I trust and hope no person so frivolous ever learned the art of telegraphy. What Nettie says about drinking, chewing and smoking is perhaps true in her case, as far as she knows, but I do not think she is acquainted with telegraph operators very extensively, for I know several that neither smoke, chew nor drink, and I think can all say *No* with courage equal to that of — myself, for instance. I neither smoke, chew nor drink, and, in fact, never was the possessor of any of those filthy articles which, when used by man, make him a beast. If I have been asked to drink and smoke once I have been asked the same question a thousand times, and, thank God, I have the courage to say no unflinchingly, and without the least hesitation, and always have had that courage, and trust and hope I always will. Our friend "Frankie" would feel taken down a little if Nettie should happen to be an old maid of about thirty-five, for she must be getting pretty well along in years, and wants to get married pretty badly, or she would not be so particular about his being married. I am sorry to hear that Miss Nettie talks of bidding us farewell on account of financial troubles. If she cannot really afford to take THE TELEGRAPHER, I will be one of eight persons to send it to her for a year, for the sake of hearing from her occasionally. I believe that hers is the only lady's signature that I have noticed lately in THE TELEGRAPHER, and would be very sorry to lose the pleasure of reading her articles (if a lady she is) for the small sum of twenty-five cents. If any brother operator is willing to help send her this noble paper, let him respond through its columns, and I will be on hand.

ELIAS.

Bounty Land Warrants to Army Telegraph Operators.

TO THE EDITOR OF THE TELEGRAPHER.

ABOUT a year since, during a session of Congress, we saw many communications printed in THE TELEGRAPHER and *Journal* in relation to the subject of a Government grant to military operators who served during the late civil war. The correspondence suddenly ceased, since when not a word has been published or spoken of the matter. Was the subject definitely disposed of at that time, and the verdict rendered that army operators were not entitled to any Government recognition? Why are all the army boys so silent?

There are hundreds scattered all over the country, who served the Government faithfully, and endangered their health and lives by exposure, and many who not only nobly faced hardship and exposure, but so gallantly stood at their posts of duty amid the whistling bullets on many fields of battle. Are not these men, who so faithfully served their country, and whose services were, in many instances, greater than whole regiments, entitled to a hundred and sixty acres of land?

I would like to hear from my former companions-in-arms upon this subject, and ascertain if a petition cannot be successfully circulated.

We have good friends at Washington, who would do their utmost in our behalf.

AGITATOR.

The Northwestern and Northern Pacific Telegraph.—Bulls.—An Incredulous Wife.

NORTHERN PACIFIC R. R., Jan. 27.

TO THE EDITOR OF THE TELEGRAPHER.

NOT seeing anything in THE TELEGRAPHER of late from this part of the universe, perhaps it would be as well to let the fraternity know that we have 225 miles of wire, well put up, and scientifically repaired when necessary, "by one H. S. Lyle." Mr. O. C. Green is Superintendent for the N. W. Telegraph Co., and has charge of over 600 miles of wire. He is a kind, gentlemanly fellow, and highly esteemed by all of the N. P. operators and his numerous friends outside of the lightning department.

(Continued on page 35.)

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, FEBRUARY 7, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

TERMS OF SUBSCRIPTION.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of **THE TELEGRAPHER** will commence with the number for SATURDAY, JANUARY 30, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

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TELEGRAPHIC FRATERNITY,

whose organ it is and will continue to be. It is a thoroughly

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The New Volume of The Telegrapher.

IT may be of interest to the many friends of THE TELEGRAPHER scattered throughout the country and the Dominion of Canada, to learn how the new volume has been received, and what its prospects are. It gives us pleasure to be able to state that its reception has been all that could reasonably be desired, and that the prospects of the paper were never better than at the present time. The new subscriptions have more than made good those which expired at the close of the last volume, and we are daily receiving assurances, which are most gratifying, that the paper is appreciated and its general course approved by those in whose interest it is published.

The series of articles commenced by Mr. F. L. POPE, in the first number of the present volume, on the "Elementary Principles of Electrical Measurement," have met with very general and warm approbation. These will be continued for some months to come, and will afford instruction and information which will be of great value to every telegrapher.

We have also made arrangements for contributions from other able writers, scientists and expert telegraphers, of series of articles on practical telegraphic subjects, which will be not less valuable than Mr. POPE's, and will add to the (we think we may say without egotism) high reputation of THE TELEGRAPHER as a scientific and practical telegraphic organ.

Of course, all these cost money, but we rely confidently upon the support which has never yet failed us, from those interested in telegraphic pursuits, to bear us out in any reasonable amount of expenditure in maintaining a first class telegraphic journal, which shall be a credit to the telegraphic fraternity of the United States and Canada, whose organ and representative it is.

We shall publish next week a carefully prepared article, discussing the comparative advantages of the differential and bridge systems of duplex telegraphy. This is a matter of much importance, and has of late given rise to a great deal of discussion among practical telegraphers throughout the country. This will be found of much value and interest.

These articles will be illustrated by all the necessary cuts and diagrams, to enable them to be readily understood, even by telegraphers who have not been so fortunate as to obtain any special scientific education.

We would ask that our friends will call the attention of their associates and others to the character of THE TELEGRAPHER, and continue to aid us in securing for it a constantly and rapidly increasing circulation.

Telegraph Inventions and Inventors.

THE litigation of the extraordinary patent granted to the late Prof. PAGE under the special Act of Congress, which by no means contemplated anything of the sort, is likely to reopen the discussion and investigation of the claims not only of the patentee but of others who have occupied a prominent position as telegraphic inventors. Hitherto these investigations have only been pursued so far as was required to serve the purposes and interests of the contestants, and until the expiration of the earlier patents it was not deemed advisable to invalidate them—which would result in making the telegraph business free and unrestricted to everybody. It is, perhaps, needless to remark that this reason does not now exist, and therefore, in the present litigation, the whole subject will be necessarily most thoroughly and exhaustively considered, who ever may suffer therefrom.

It is the purpose of the present owners of the PAGE patent to reestablish a monopoly in telegraphing in this country, which will assuredly be accomplished if the validity of that patent, as reissued, should be judicially sustained. It was supposed that, with the expiration of the patents granted to Prof. MORSE, there no longer existed a possibility of restricting or making tributary any telegraphic interest. Those patents, or the more essential and important of them, had expired by regular limitation—had been extended and renewed, and having reached the utmost term which could be granted to them, except by special legislation, had become public property. Whether rightfully granted or not, they had been acquiesced in and tribute paid under them to the patentee, and those holding through or under him, to a very large amount. The effort to enforce them against the Bain Chemical and House Printing Telegraph Systems had, it is true, failed, but neither of them ultimately proved very formidable rivals, and the value of the patents had proved to be very great. As before remarked, they had become public property, and there seemed to be no longer any obstacle to their actual realization as such by the people.

The desire of Congress to do honor to Prof. PAGE, as a scientific and worthy American citizen, who had, it was contended, been unjustly deprived of the credit which was due him as the real inventor of what is known as the Rhumkorff coil, and of certain other inventions in magneto-electrical devices, led to the passage of the act under which the patent which is now attempted to be enforced was issued. There is abundant evidence in the act as passed, and in the discussion in both the House of Representatives and the Senate, on its passage in those bodies respectively, that at that time there was not the slightest intimation, suspicion or intention that it should apply to telegraphy in any way. There is no evidence that even up to the time of his death Prof. PAGE had any idea or intention of making the telegraph interests of the country tributary under his patent. As a matter of fact he died in pecuniarily straitened circumstances, and his last days were troubled because he had been unable to make suitable and adequate provision for his family. Subsequently to his death an attempt was made to dispose of the patent for a valuable consideration, the price asked for it being a half million of dollars, but no purchaser could be found at any price. It was offered to its present owners, the Western Union Telegraph Company, who had it carefully investigated by experts and by the best legal talent, and rejected it as worthless and valueless. How it was subsequently purchased by that company, and for what purpose, the readers of THE TELEGRAPHER are tolerably familiar with.

It has since been reissued so as to cover essential telegraphic devices more completely—the Patent Office officials apparently deeming it incumbent upon them to grant anything that is asked in the name of their late associate, and the attempt is being made to establish judicially its validity.

The effect of the success of this attempt we have already pointed out, but it cannot be kept too prominently in view of those interested. It renders all telegraph interests in the country tributary to the owners of the patent for years to come, and it would in that event undoubtedly prove the best investment which has been made in patents for a very long time. This would be no argument against it if its claims, or those made under it, were legal, just and equitable; but they are not, and if contested, as they must be, they can never be so declared by any court.

As was stated at the beginning of this article, this litigation will lead to a thorough and exhaustive investigation of telegraphic inventions and patents during the last forty or more years, and will be likely to alter materially the assignment of honor and credit for such inventions from what they now are. It will undoubtedly prove that to Prof. JOSEPH HENRY, of the Smithsonian Institute, more than to any other single person, living or dead, belongs the honor and credit of the discoveries, and inventions which have made the American

system of telegraph practical and successful. The principal devices described in the PAGE patent were known, demonstrated and described, some of them years before Prof. PAGE, as those who hold under him claim that he discovered and invented them.

To no one man or nation belongs the honor of inventing the electric telegraph. As was better stated in a "Condensed History of the Electric Telegraph," prepared by Prof. VAN DER WEYD for and published in the *Manufacturer and Builder*, which was reprinted in THE TELEGRAPHER for March 8th, 1873, than we can do it:

"The electric telegraph is a forcible illustration of the power of accumulated human intellect. During several centuries scores of the most ingenious men have, by assiduous investigation, discovered facts upon facts—succeeding generations standing mentally on the shoulders of their ancestors, till, finally, one century ago the first real electric telegraph was born in that centre of political liberty and inventive genius, Switzerland.

One of the first duties in science is to 'give honor to whom honor is due;' as latter brilliant inventions tend to eclipse former more valuable discoveries on which they are based, and as even the names of former great investigators and laborers in the field of scientific progress become forgotten, we think it highly useful to give here a kind of chronology of the discoveries on which our knowledge of electricity, and the subsequent series of inventions which culminated in the modern electric telegraph, are based. It will show the reason why Switzerland, Germany, France, England, America and even Russia claim this invention—while the fact is that they all had their share in it, and that no single nation, and much less no single individual can lay any other claim than having taken advantage of the investigations of others, and perhaps sometimes added some novelty, very trifling when compared with the knowledge inherited from predecessors. It also illustrates the truth of one of Prof. Tyndall's sayings in one of his recent lectures here, that the scientific investigators are the real workers, discoverers and inventors, of which patent applicants take advantage. In this respect we cannot omit calling attention to the historical fact that Prof. Joseph Henry stands foremost in preparing the way for the realization of the invention in question, which, after his labors were finished, required scarcely a single step forward."

As experience for many years past has shown, and as all who have to deal with telegraphic interests are aware, there is practically no end to the inventions and discoveries, or what are supposed to be such, that are constantly being brought forward. Enthusiasts are constantly deluded with the idea that they have made remarkable and valuable discoveries and inventions (and not unfrequently succeed in deluding others into a similar belief) which, upon investigation, turn out to be either old, or, at the best, merely rediscoveries, or else practically worthless. There has been such an active and exhaustive investigation into electrical science and telegraphic inventions that the field has been pretty well cultivated. We do not mean to say, or wish to be understood as intending that there is no possibility of any further valuable and novel discoveries and inventions in this department, but that the chances are that what is claimed and believed to be new is not so, and that proper investigation will generally save useless expenditure of time and money, and, perhaps, cruel disappointment in the end. As an instance of a very numerous class of such supposed inventions, we might cite a case which recently came to our knowledge, where a callow scientist and telegrapher wrote to an electrical expert of an invention which he had made, which must come into general use and prove very valuable, and proposing that he should take an interest in it, and get the patent for the invention for him. A description and sketch of the invention was included in the letter, which proved to be nothing more than a *common electrical bell!* of which thousands are probably made and sold every year. We have no doubt but that the same is true of almost every important or unimportant department of art and industry, but our attention has naturally been particularly attracted to electrical and telegraphic inventions and patents.

It is not our purpose to trace the invention of the telegraph, or to show how it was slowly developed until it has reached its present state of perfection. We merely desire to attract attention to this subject of tele-

graphic inventions and inventors that our readers may fully understand the litigation which is going on in regard to the PAGE patent, to which, it is probable, we may be obliged to refer frequently for some time to come.

Telegraph Messengers in Uniform.

WITH the commencement of the present month the messengers employed in connection with the delivery department of the Western Union Telegraph Company in this city, numbering about 130, appeared in a new uniform, neat and comfortable in appearance. This regulation is a very good one, and should have been adopted, and has been attempted to be introduced once or twice before, but was abandoned on account of the opposition of the messengers themselves to it.

The uniform adopted consists of a cap of the Prussian undress service, edged with scarlet, and a button or metallic rosette with the name of the company on the front. The clothing is of dark blue pilot cloth, well made and warm, the surtout buttoning close up to the neck, with a leather belt round the waist, bearing the name of the company. On the belt is attached a long leather pouch, in which to place the messenger's book and messages.

The public will soon become familiar with this uniform and its advantages will be apparent, while we can see no reason why any messenger should object to its use while on duty.

It would be well for each company doing business here to adopt a distinctive uniform for its messengers, so that persons who may receive despatches may be assured, when a message is received, of the office or line from which it comes, and that the person presenting it is duly authorized to receive replies, if any be required, and that they will be promptly returned to the office. We could suggest an addition which we think would prove of service in many cases—that each messenger have conspicuously displayed a number by which he may be identified, if it should become necessary or desirable.

(Correspondence continued from page 33.)

Mr. C. M. Greene is our Division operator. Clem is a fine fellow, kind and accommodating, and yet withal a good disciplinarian. We are a happy lot of boys out west, and highly fortunate in having such able and gentlemanly officers.

Here is a telegraphic bull, related to me by the victim: S telegraphs from Z to his son at — to send him his two horse collars. Judge of his amazement on the arrival of the train to find his two horse colts on board instead of the "collars." The telegraph boys paid the freight both ways, and told him to say no more about it. Another operator at J— takes a message to Mrs. R—. She inquires who the message is from? "Why," says J—, "from your husband." "No, it can't be," says she "because I know his writing, and it don't look like that; you are trying to fool me." All of J—'s arguments seemed to be of no avail, until he told her that her husband would certainly be on the train, and expecting to see her. That closed the affair. She went, found her better half, and has often wondered why J— should try to make her believe it to be from her better half, when she "knew his handwriting well enough." N. P.

A Defence of the Telegraphic Fraternity.

TO THE EDITOR OF THE TELEGRAPHER.

I FEEL it my duty to say a word in defence of telegraphers as a class, after reading such terrible assertions as some of your correspondents have made in regard to their moral character. One of the laws of nature is that "Water always finds its level." So it is with individuals; they take their position in society just where they belong, as naturally as water finds its level, whether telegraphers or others. Now, if there is in some locality some telegraphers who do not bear a good character, must that necessarily place an indelible stamp on the whole fraternity, as consisting only of such characters? I am happy to say that on *this* line the telegraph operators, as a class, are respectable, intelligent and influential men, who are at the head of all good enterprises in society. Some have even said it was useless to try to elevate the moral standing of this fraternity. We are truly thankful all are not of that opinion. (Our worthy editor, for one, is not.) If I was to gratify my passions, I would say these are the very ones to start with, and the best method of elevating

them would be to set them up in the *boot and shoe business*, which, at least, would have a strong tendency to elevate them. S. L. C.

Personals.

Mr. C. O. MCGREW has been appointed operator of the United States Military Telegraph, at Mountain Springs, Cal.

Mr. JOHN GIFFORD has been appointed operator U. S. Military Telegraph at Stanwix Station, Arizona Territory.

Mr. JOHN W. STRAUCHEN has been appointed operator of the U. S. Military Telegraph at Wickenburg, Arizona Territory.

Mr. C. W. GEARHEART has been appointed operator of the U. S. Military Telegraph at Maricopa Wells, Arizona Territory.

Mr. R. H. HOWE has been appointed operator of the U. S. Military Telegraph at Tucson, Arizona Territory.

Mr. MAURICE GOLDWATER has been appointed operator of the U. S. Military Telegraph at Phoenix, Arizona Territory.

Mr. THOS. E. ATKINSON has been appointed operator of the U. S. Military Telegraph at Yuma, Arizona Territory.

Mr. WM. B. ELLISON has been appointed chief operator of the U. S. Military Telegraph, with headquarters at Prescott, Arizona Territory.

Mr. C. P. ADAMS, telegraph operator and station agent of the Grand Trunk Railroad, at Gotham, N. H., has resigned, and accepted a similar position with the Central Pacific R. R. at Corinne, Utah.

Mr. J. WILLSON UTT, formerly extra telegraph operator on the Lehigh Valley Railroad, has been tendered and accepted the office of chief operator in the office of the North Pennsylvania Railroad Company, at Front and Willow streets, Philadelphia. This is a good appointment, as Mr. UTT is an excellent operator and intelligent gentleman. No appointment has yet been made to the position on the L. V. Railroad vacated by Mr. UTT.

The Telegraph.

A Practical Test of the Automatic Telegraph System.

ON the evening of January 27th last the Automatic Telegraph Company made a demonstration of the actual working of their system, in answer to the criticisms and statements of President William Orton, of the Western Union Company, in his letter to Postmaster General Creswell of December 27, 1873. There were present from the Western Union Telegraph Company Mr. Geo. B. Prescott, the electrician of the company in New York, and Mr. Leonard Whitney, manager of the Western Union office in Washington. Several other gentlemen, not connected with either company, were also present in the New York and Washington offices.

The matter transmitted was the President's Message and the Spanish Protocol attached, numbering 11,130 words.

The operation of punching the matter on the strips for transmission was commenced in Washington at 5:39 P. M., and the document was copied complete in New York at 6:48 P. M., occupying in all but 69 minutes—against 70 minutes—the time occupied by the Western Union Company in its transmission. The average time was 55½ minutes—against 59 by the Western Union.

But one wire was used by the Automatic process, while the Western Union used eight.

The persons employed were ten perforators, thirteen copyists and two Morse operators, while the Western Union Company employed sixteen expert Morse operators on their eight wires. The average pay of perforators and copyists is stated to be \$40 per month.

This is claimed to be a complete refutation of the statements made by Mr. Orton, and especially the assertion that it would require seventy-eight persons to do this work automatically in the time employed by the Western Union Company.

West India and Panama Telegraph.

A SPECIAL general meeting of the shareholders of the West India and Panama Telegraph Company was held in London on the 14th of January, at which the directors of the company resigned, and a new board, comprising Sir James Anderson, Mr. H. Weaver, Mr. C. W. Earl, Mr. W. Ford and Mr. H. Holmes, was unanimously elected.

This company has been unfortunate, and the shareholders believe, badly managed, which created much dissatisfaction, which was manifested by the fact that the number of proxies placed in the hands of the com-

mittee of shareholders, who have been endeavoring to effect a change in the management, were six to one, placed in the hands of the old board of directors.

The meeting adjourned till the Wednesday following, at the office of the company to complete the election.

Foreign Telegraphic Notes.

The directors of the Globe Telegraph and Trust Company have declared a dividend of 3s. per share—being at the rate of 6 per cent. per annum upon the preference shares of the Company.

The Anglo-American Telegraph Company has declared a balance dividend of 2 per cent.—being, with that previously paid, at the rate of 6 per cent. per annum for the eight months ended the 31st of December, 1873. The Company, after the payment of this dividend, will remain with a cash balance of about £250,000, besides about 900 miles of spare cable. The annual general meeting will be held at the Loudon Tavern, on Friday, February 13th.

The total number of messages forwarded from postal telegraph stations in the United Kingdom, during the week ending January 10th, 1874, was 313,696, an increase on the corresponding week of the previous year, of 38,355.

The Eastern Telegraph Company have announced the opening of their new lines from Otranto, Italy, to Zante, Greece, and from Zante to the Island of Candia. Messages should be marked, "Via Zante direct;" and the rates to Greece will be the same as by the old route via Volo. This company also announce that they are prepared to accept messages for Para, Bahia and Rio Janeiro, to be posted from Lisbon to Pernambuco, and telegraphed thence to their destination.

The traffic receipts of the Submarine Telegraph Company for December, 1873, amounted to £7,798 against £7,466 for the corresponding month of the previous year.

The total traffic receipts of the Great Northern Telegraph Company, during the month of December last, amounted to 287,137f. (£11,485), and for the month of December, 1872, to 204,752f. (£8,190). The receipts on the European lines amounted to 142,938f., against 106,294f. in December, 1872; and on the China and Japan lines, to 144,198f., against 98,458f. in the month of December, 1872.

Reuter's Telegraph Company has announced that telegraphic communication is restored between Shanghai and Hong Kong.

Telegraph wires now extend from Copiapo to the Arancaian frontiers of Chili.

The government of Salvador has had to pass laws, with severe penalties, against those who destroy the telegraph wires. It has been found that the people are apt to cut off long pieces of the wire, and use them as strings to dry clothes on.

The Bishop of Pampaluna, in Sautander, Bogota, has given his blessing to the Electric Telegraph there, and, in his address to the people, begged them to respect the invention as being necessary for the progress of society.

The telegraphic line lately constructed and connecting Valparaiso, Chili, with Malvoa, Angol, Nacimiento, Chiguaihue, Callipulli and Mulchen, has been in working order.

Telegraphic and Electrical Brevities.

SCIENTIFIC TELEGRAMS.—Last year Professor Henry, of the Smithsonian Institute, secured the privilege of a free exchange of scientific information—such as the discovery of new planets or comets—over the Atlantic cable. The Western Union Telegraph Company has agreed to send such despatches free of charge over all parts of the United States. The French telegraph companies have offered the same privileges, and recently the Director of the Russian Imperial Telegraph consented to the same arrangement.

The Western Union Telegraph Company have obtained an injunction against the Manhattan Telegraph Company, restraining them—the directors, etc.—"from in any manner molesting, injuring, obstructing, or interfering with any telegraph pole, line or wire owned or used by the plaintiff, and from erecting or constructing any telegraph pole, line or wire at or between any point or points on any side of any street, avenue, square or public place in the city, at or between which point or points any telegraph pole, line or wire is now or shall hereafter be erected or constructed by or for the plaintiff."

The cable laid in 1869 across the straits at Cape Canso was fouled in December by the anchor of a vessel, and parted. The difficulty of laying a cable there in the winter season is very great—the current running

eight knots an hour, and huge masses of ice sometimes wedging up in a night the whole passage. However, Mr. George Robinson, who has charge of repairs there, gathered up a number of spare pieces of cable at Plaster Cove, joined them carefully, and on the night of January 25th succeeded, after much toil, in laying it and restoring communication.

Mr. F. A. ABBOTT, a witness for the defence in the case of John J. Kiernan vs. the Manhattan Quotation Company, of this city—which is being heard before Rufus F. Andrews, Referee, being charged with stealing the plaintiff's news—refused to answer the question as to how he obtained news for defendant, and was sent before Judge Lawrence for contempt.

The shares of the Atlantic and Pacific Telegraph Co., and of the American District Telegraph Co. have been placed on the list of the New York Stock Exchange, and there is already considerable dealing in them.

Gov. Straw, of New Hampshire, has conveyed to the United States Direct Cable Co. the right to use 4,000 feet of land at Straw's Point, near Rye Beach, N. H., for the use of the ocean telegraph cable now being manufactured in England for that company. The grantees are to erect and maintain substantial and comely buildings, and the land to be used only for the purposes indicated in the deed of conveyance.

A Telegraphic Defaulter.

MR. BYRON W. BARNARD, who, under the name of William Bernard, was at the time employed in the Cincinnati, Ohio, Western Union office, volunteered during the pestilence which raged so fearfully at Shreveport, La., last summer for service in the Western Union office there, which offer was promptly accepted. He was given the management of the office, and escaped the pestilence, only to prove a defaulter and swindler. In two months he had squandered all the company's funds in his possession, swindled his assistants by obtaining their receipts for salaries which had not been paid, and nearly sacrificed his life in a fit of *delirium tremens*. This is not the first of his swindling transactions, and, however commendable may have been his conduct in volunteering for what may be called a forlorn hope, he is not entitled to pity or commiseration.

Buchanan and Saville, who also volunteered for this service, fell victims to the disease, and sad as must their fate be regarded, it was far preferable to that of Barnard, who has thus recklessly wrecked the chance which was afforded him for redemption.

The Postal Telegraph Debate.

THE Gardiner Hubbard and William Orton Debating Society has been revived at Washington, and held meetings before the Senate Post-office Committee yesterday and the day before. Their theme was the novel one of the Postal Telegraph. The subject will be continued indefinitely for some years.—*Springfield Republican*.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended January 13, 1874, and bearing that date.

No. 146,421.—ELECTRIC SHIP ALARM. James B. Andrews, New York, N. Y. Application filed November 6, 1873.

Deviation of compass operates a circuit closer controlling an alarm.

In combination with a magnetic needle or bar, suitable means adapted to be influenced by any change in the relative position of said needle with the ship, and an alarm device for denoting such change, substantially as hereinbefore set forth.

No. 146,444.—ELECTRO-MAGNET. Hippolyte Fontaine, Paris, France. Application filed, October 2, 1873.

A magnet formed of a series of thin flexible metallic blades, strips, or their equivalent, assembled and bound together by pieces of copper, soft iron, or malleable cast iron, substantially as shown and described.

No. 146,463.—TELEGRAPH RELAY. Sandford Howard Lombard, Winona, Minn. Application filed November 28, 1873.

Movement of armature invariably shunts one coil entirely, and a determined portion of the other out of circuit.

1. In combination with a relay a shunt circuit to a portion of its coil, brought automatically into action by the movement of the armature to the magnet, and an additional shunt adjustably connected thereto by a switch, substantially as set forth.

2. In combination with the shunt circuit *h*, the switch *D*, and connections *e e'*, substantially as described.

3. The combination of the contact point *a'*, conductor *a*, post *C*, switch *D*, points *e e'*, conductor *h*, and armature lever *b*, constructed and arranged substantially as described.

No. 146,490.—ELECTRICAL APPARATUS FOR SHIPS' REGISTERS. Niles H. Thompson, Albion, Mich. Application filed December 24, 1873.

Register chart moved to correspond with deflections of needle through electrical apparatus controlled by a circuit made and broken by needle.

1. The combination, with a magnetic needle, of an electrical circuit and circuit closers (the circuit closers being arranged to

indicate any deflection of the needle), and devices operating to remove the circuit closers from contact with the needle.

2. The combination with a registering apparatus, of a magnetic needle, and an electric circuit controlled by said needle operating to convey any deflections of the needle to the registering apparatus, substantially as set forth.

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TELEGRAPH, WIRES, INSTRUMENTS, BATTERIES, TOOLS, INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

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UNION BRAND, AND UNION BRAND EXTRA QUALITY. JOHNSON'S WIRE.

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A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS CONSTANTLY ON HAND.

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PATENT ELECTRIC WATCH-CLOCK THE BEST IN USE.

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Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS. AND PRICES EXTREMELY LOW.

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OUR PROFITS HAVING BEEN AMPLE,

WE OFFER OUR CUSTOMERS THE BENEFITS OF THE RECENT REDUCTION

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TELEGRAPH INSTRUMENTS and SUPPLIES,

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WILL CONSULT THEIR OWN INTERESTS BY PURCHASING FROM US.

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A Special Discount given on Cash Purchases.

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Agents for KIDDER'S MEDICAL APPARATUS.

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IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3. \$4 00
A WELL FINISHED AND GOOD WORKING SOUNDER, No. 4. 3 00
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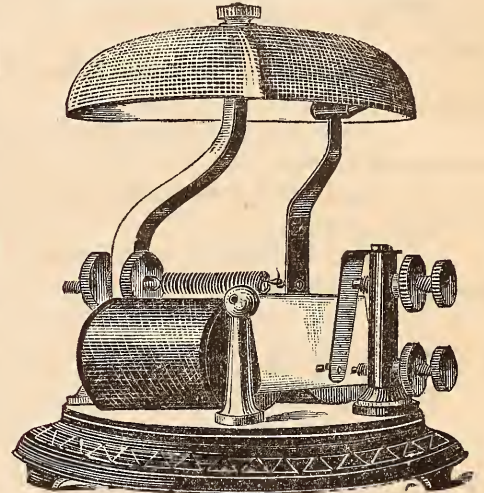
Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

Special attention given to REPAIRS and MODEL WORK.

W. HOCHHAUSEN, Manufacturer of ELECTRICAL INSTRUMENTS,

132 WILLIAM STREET (rear),

Between Fulton and John Streets, NEW YORK.



One half of actual size

ELECTRIC BELL, PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard.

Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00

Sounders, from..... 4 50 to \$6 50

Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00

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Send for Illustrated Circulars.

The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

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CAUTION.

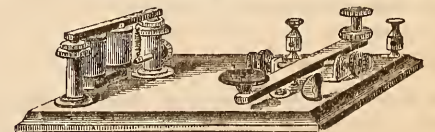
All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY Co.,

No. 40 West 18th Street.

New York, October 11, 1873.

TILLOTSON'S EXCELSIOR TELEGRAPH INSTRUMENT.



(PATENTED JUNE 24, 1873.)

This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.

Price, complete, Sounder and Key mounted on finely finished Mahogany Base, with one Cell Hill's Patent Battery, with Chemicals, eight feet of Office Wire, and "Smith's Manual of Telegraphy"..... \$7 50

Two sets..... 14 50

Price of Sounder and Key only..... 6 50

" " with Cut Out and Lightning

Arrester attached..... 7 50

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L. G. TILLOTSON & CO.,

No. 8 DEY STREET, N. Y.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

J. E. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Allegheny, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
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New Haven, Conn.,
Newark, N. J.,
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Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

One Distinctive Feature of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The Automatic Signal Boxes.

Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDER made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
 DAVID BROOKS, Proprietor,
 22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
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 P. O. BOX 496.

American Compound TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time ensuring

EFFICIENCY AND RELIABILITY.

Address—
American Compound Telegraph Wire Co.,
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
 FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH

in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,

which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS

of all kinds,

CHRONOGRAPHS,

ASTRONOMICAL CLOCKS,

REGULATORS,

ETC., ETC.,

OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES

OF

EVERY DESCRIPTION,

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NEW AND SUPERIOR PATTERNS OF

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These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS, SOUNDERS, REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
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THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

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Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

BRADLEY'S BOX RELAYS AND SOUNDERS.

BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOGGHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

Descriptive Circulars and Price List forwarded upon application to

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OF EVERY DESCRIPTION.

Agents and Manufacturers for

THE AMERICAN FIRE ALARM, GAMEWELL & CO., N. Y.

Specialties made of

HICKS' REPEATERS, HICKS' RELAYS,

SURE-CONTACT KEY, "NOVELTY" SOUNDER,

Cheap Instruments for Learners, Amateurs, &c.,

NEW GRAVITY BATTERY,

Hotel and Private House Electric Annunciators,

BURGLAR AND FIRE ALARMS,

Dial and Printing Instruments for Private Telegraph Lines,

CALL BELLS AND ALARM BELLS of every style.

Batteries, Chemicals, Wire, Insulators, Supplies, &c., &c.

MODELS and LIGHT MACHINERY made to order.

PRICE LIST.

Hicks' Repeaters (1873).....	\$100.00
Hicks' Relays.....	from \$12.00 to 18.00
Main Line Sounders.....	" 12.00 " 19.00
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Annunciators, per room.....	" 7.00 " 12.00
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No. 4 LEADER BUILDING, CLEVELAND, O.

DR. L. BRADLEY,

No. 9 Exchange Place,

JERSEY CITY, N. J.,

Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter with a huddled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

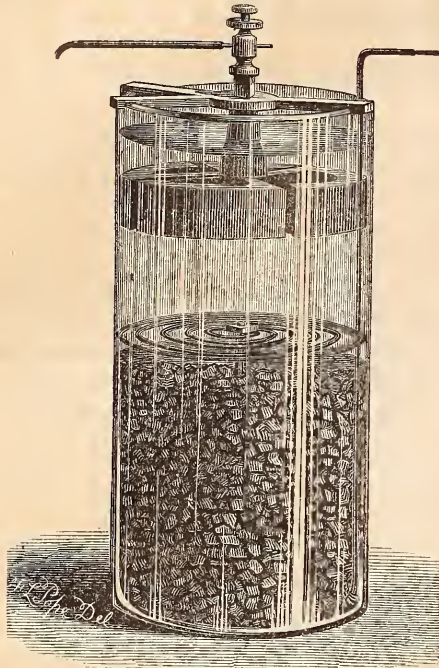
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1/800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1/150th to the 1/300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

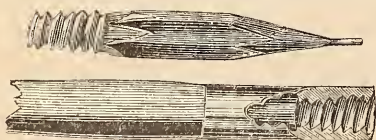
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

NEW YORK, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

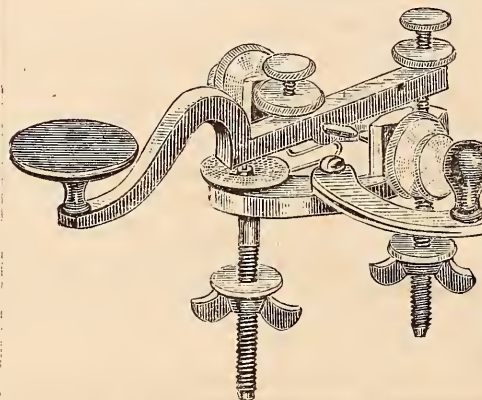
GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

WATTS & COMPANY,
47 Holliday Street,
BALTIMORE,
MANUFACTURERS OF
ELECTRICAL AND TELEGRAPH INSTRUMENTS
AND
Material of Every Description,
RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.
Nickel Plated Goods a Specialty.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



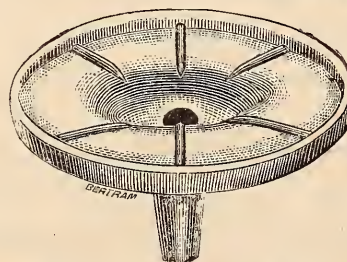
Price, \$5.50 plain; \$7 nickel plated.

The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK,
Sept. 22d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,
A. S. BROWN, Manager



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

SWITCHES, GALVANOMETERS, RESISTANCE COILS, &c., to order.
Designs for Switch Boards for special service furnished.

SCOTT'S PATENT ANNUNCIATOR,
for Hotels and Residences.

THE BEST TELEGRAPH MATERIAL
IN THE WORLD
IS SUPPLIED BY
L. G. TILLOTSON & CO.,
8 Dey Street, New York,
MANUFACTURERS, DEALERS and IMPORTERS
OF
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, February 14, 1874. Whole No. 396

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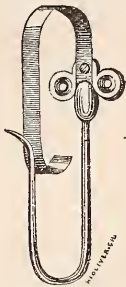
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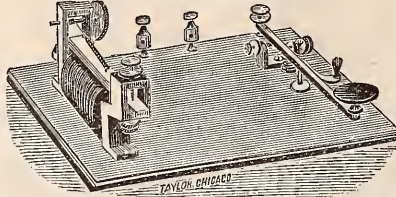
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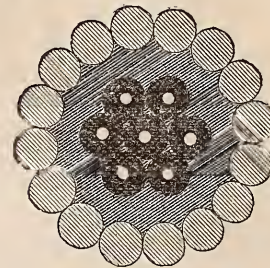
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THE TELEGRAPHER

A JOURNAL OF ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, FEBRUARY 14, 1874.

VOL. X. WHOLE No. 396.

Written for THE TELEGRAPHER.

A Psalm of (the Telegrapher's) Life.

BY J. H.

Tell me not, in mournful numbers,
Telegraphing is a dream;
For the "plug" should die that slumbers,
Or reads by the tape machine."

For 'tis real, ditto earnest—
Imperfection's not its goal;
Plug thou art, and plug remaineth,
Was not spoken of us all.

Others writing should remind us
We can make our writing fair;
And our breaks be no more numerous
Than a good receiver's share.

Let us, then, begin to practice,
Making each our sphere in life;
Still achieving, still pursuing,
Shun contention, wrangling, strife.

MAUCH CHUNK, Pa., February 9.

* The Morse recording apparatus is referred to.

Original Articles.

The Bridge vs. the Differential Duplex.

BY F. L. POPE.

IN THE TELEGRAPHER of July 12, 1873, was published a description of the Stearns Duplex Telegraph, arranged on the differential plan, which had at that time been in successful operation for more than four years, first on the lines of the Franklin, and more recently upon those of the Western Union Telegraph Company. Within a year past another form of duplex apparatus, upon a different principle, also invented by Mr. Stearns, has been largely introduced upon the Western Union lines. The patent for this latter system, which is known as the "bridge duplex," was granted November 12, 1872. It involves the principle of the well known electrical balance, or Wheatstone bridge, the respective resistances being so adjusted as shunt the outgoing current around the receiving relay, leaving the latter in a neutral condition, ready to be affected solely by the current arriving from the distant station.

Although the "bridge duplex" has always been a great favorite with the electricians and managers of the Western Union Company, judging from the number of them that have been placed on the lines, the opinion of the practical telegraphers who actually do the work has almost uniformly been strongly in favor of the differential system, the general impression being that the latter worked much better than the bridge instrument under unfavorable conditions of insulation. As this is a matter of a good deal of practical importance, a short discussion and comparison of the principles involved in the question will be of interest to the readers of this journal.

The accompanying diagram will serve to illustrate the arrangement of circuits in the bridge system. Only one terminal station is shown, the opposite station being its exact counterpart in every particular.

One pole of the main battery, E, is connected with the ground, and the other with the lever of the key K. A supplementary lever, K', is so arranged at the back of the key lever that when the latter is depressed contact is made between K and K' before it is broken between K' and P—the effect of which is to keep the latter connected direct to the ground, except when the battery E is inserted by depressing the key. When a current is thus sent from the battery E it divides at H, one portion going through A to the line L, and the other going through B and the rheostat X to the ground. The relay R—which is of the ordinary kind—is placed in a circuit between F and G, called the "bridge wire."

The circuits being thus arranged, it will be obvious to any one familiar with the principle of the bridge, that when the various resistances are arranged in the following proportion:

$$A : B :: L : X,$$

no current will flow through the bridge wire F G, and consequently the relay R will not be in the least affected by the outgoing current.

On the other hand, if the line current be increased by the closing of the key at the opposite end, the addi-

tional current arriving at F will divide—part going by A to H, and part going through the relay R to G and thence through B to H, where it joins the first mentioned portion, and the reunited currents go through K' to the ground. A portion also diverges at G and passes to the ground through X.

Now, if we carefully examine the diagram, we shall find that, in order to send the greatest possible portion of the current into the line, the resistances of B and X should be as large as possible in comparison with the resistances of A and L. Again, the most favorable proportion of resistances for receiving is the one that will cause the greatest proportion of the current to pass through the bridge wire F G and relay R. In order to do this we must make A as great as possible in comparison with R and B.

It will, therefore, be evident that the best arrangement for transmitting is the most unfavorable for receiving, and vice versa, and that in practice it is necessary to find the most advantageous compromise between these antagonistic conditions.

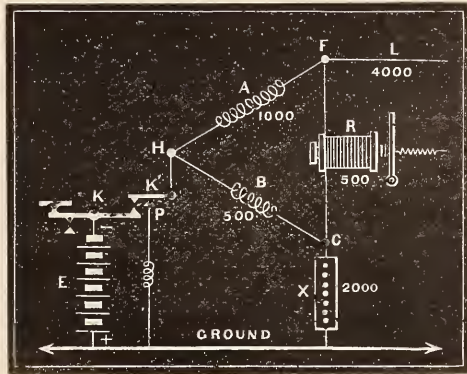
A series of experiments, made by inserting a tangent galvanometer in the bridge wire instead of a receiving relay, have shown that the best results are attained when the proportion between the various resistances corresponds with the figures given in the diagram, or A = 1,000, B = 500, L = 4,000, X = 2,000, R = 500.

These figures are the same as those given in an article describing this system published in the *Journal of the Telegraph*, Sept. 1, 1873.

Taking these, therefore, for our basis of calculation, let us ascertain how much current can be made to pass through the relay in order to record the incoming signal.

The joint resistance of the two routes from G via X and B is $\frac{2000 \times 500}{2000 + 500} = 400$. Add the relay resistance,

500, and we have 900 as the total resistance of the relay route between F and the ground. The resist-



ance of the branch A is 1000; therefore the current dividing at F will give the relay 1/3, or .526—only a little more than one half of the current received from the line at F. But the current has already been divided at the sending station and two thirds sent to ground through B and X, leaving only one third to go to line, which, upon reaching F at the receiving station, is again divided, the relay getting but one half of this, or only about 16 per cent. of the entire current leaving the battery at the sending station, even under the most favorable circumstances.

It is not practicable to increase the sensitiveness of the receiving relay by substituting one of lighter resistance, because by so doing a greater proportion of the current is forced through the branch A, and the amount passing through the relay correspondingly diminished. On the other hand, if an attempt be made to lessen the resistance of the relay, the current passing through it is indeed increased, but the number of convolutions in the helices is lessened, and the magnetic effect diminished in the same ratio.

The proportion of the current arriving at the receiving station, which is given in the above calculation, will ordinarily be still further diminished by leakages on the line, and it has been found in practice that the bridge system can scarcely be worked at all on a long line in wet weather. Efforts have been made to increase its efficiency by "piling on more battery"—the usual panacea for badly working lines—with substantially the usual result—that of increasing the escape and adding to the general misery.

When we compare the results of the two duplex systems, we find that they may be summed up as follows: In Mr. Stearns' first system—the differential—50 per cent. of the current leaving the battery at the sending station reaches the receiving relay; while in his second system—the bridge—only 16 per cent. reaches the same point. One of our leading electricians thinks that "it would be difficult for any one to devise a more beautiful and ingenious and at the same time utterly useless improvement, than Mr. Stearns has given us in his bridge duplex." The great intrinsic merits of the differential system have

enabled it to triumph over the numerous obstacles that beset it, and its success has now become an established fact. It is certainly somewhat singular that such a persistent effort should have been made on the Western Union lines to supersede it by a system so radically inferior in every respect as that which has just been described.

The Telegraphs and Telegraphers of a Quarter of a Century Ago.

BY OLD TELEGRAPHER.

THE telegraphic reminiscences which appeared in THE TELEGRAPHER some months since, prepared by the writer, called forth some very interesting communications from telegraphers relating their early experience. The subject is by no means exhausted, and it is to be hoped that we shall have more of them. Those who have engaged in the telegraph business within comparatively a few years past, have but little appreciation of the difficulties and disadvantages which their predecessors experienced when the telegraphic art was comparatively novel, and electrical science but imperfectly understood. The practical operation of telegraphs then was, to a considerable extent, a groping in the dark, and even the best qualified for their duties but imperfectly comprehended the nature of the problems which were daily presented to them for solution.

The theories which were from time to time propounded, and the efforts which were made to demonstrate practically their correctness, involved the sacrifice of a considerable amount of the capital invested, and retarded rather than promoted telegraphic progress and success.

The surface theory, so called—that is, the theory that electricity was propagated on the surface of the conductor rather than through the mass—at one time had many adherents, and the old New York and Boston House line (as was stated in THE TELEGRAPHER of March 15, 1873), was constructed on this theory. Instead of a single conducting wire, seven small wires were mechanically twisted together, and the twisted iron cord was stretched between the two cities. When new this did not materially interfere with the transmission of electric signals, as the three wires in effect formed a single conductor. In a short time, however, these small wires became oxidized, and the resistance to the passage of the signal must have been something enormous. As galvanometers for testing resistance were then but little known, the amount of this resistance cannot now be stated, but that it sadly interfered with successful telegraphy those who were then required to operate the lines very sensibly appreciated. The actual cause of the difficulty experienced was not understood at the time, but that it existed was painfully evident to everybody concerned. Another difficulty, arising from this peculiar construction of the conductor, was, that it became so thoroughly oxidized and consequently weakened that it was constantly being broken; and one of the most important qualifications of an operator was to be an expert line repairer. The line was built upon the highway, and every office had in its monthly accounts a heavy outlay for horse hire and for teams engaged to transport the operators in the search for "breaks." The number of operators employed, especially in the way offices, was very limited; and it was customary, when a break occurred between any two offices, for the operator in each to close his office and "go out on the line." It was a very common thing for customers desirous of forwarding messages to find, upon going to the office for that purpose, that it was closed, and a paper stuck upon the door announcing the fact that the operator had gone out to repair the line; or, perhaps, a messenger in charge, who coolly informed them that the line was down and the operator would "probably be back to-morrow." How much business would a telegraph line be likely to obtain, or retain, if a similar policy were now pursued?

The advantage to the company of such a policy was twofold. First, the expense of this system of repairs; and, secondly, the loss of business from the time the line was repaired until the return of the operator from a tour of from twenty to forty miles by team. This system of line repairing was continued for several years, and until the business became more extensive and more thoroughly systematized. The printed instructions issued to the managers and operators of a line upon which the writer was employed as late as 1855-56, among other things directed them, when the line was "down," to take the fastest horse that could be obtained and proceed to repair the difficulty and return to their offices with all possible speed, so as to be ready for business.

Telegraphers were not averse to this system, although it at all times imposed upon them severe labor. They used to have certain points of meeting, and made their excursions occasions of very pleasant remissions, which otherwise would have been of rare occurrence.

Another fallacy, which was almost universal, was when there was any difficulty in working the lines, that did not amount to a total interruption of conductivity, to pile on battery in order to force the sig-

nals through the wire. The Grove battery was considered the only one suitable for telegraphic purposes, and every operator was expected to know how to set up and take care of the battery. In none but the largest offices was there a person whose special duty it was to take charge of the battery, and every office was expected to have on hand an extra battery, to be added to the regular battery whenever there was an increase of the ordinary escape, which at all times, except in very dry or very cold weather, was considerable. The writer has frequently, when in charge of a large office, directed the battery man to add fifty to seventy-five cells of Grove battery to the very large batteries always used, in order to work through escape. Although even now making but small pretension to scientific knowledge, he would know that in such cases a reduction rather than an increase of battery would be likely to prove advantageous. At that time, however, even those who made considerable pretension to electrical knowledge, believed that adding to the battery power was the proper thing to do when troubled with escape of the electric current. The increase of the capacity of the conductor, and more careful insulation, have so largely decreased the necessity for battery that a large saving in this item of expenditure has been made. That this is capable of being still further economized there can be no doubt, and when, as in course of time must inevitably be the case, telegraph lines are more thoroughly insulated than they are even now, the waste of battery will be reduced to the minimum, as it is now on some lines.

The characteristics of the old time telegraphs have already been touched upon in previous articles by the present writer, and by others who have supplemented them by their interesting communications, which have appeared in the columns of THE TELEGRAPHER.

But few of them remain connected with the business. Many of them have said their last "good night," and have gone to their final account, where crosses, breaks and had insulation shall trouble them no more. Nearly the ordinary lifetime of a generation has passed since the time to which reference is here made, and naturally death has greatly depleted the number of those who, with high hopes and anticipations of what the telegraph was to become (which it may be truthfully said have already been more than realized), engaged in a business which possessed for them no ordinary fascination. They were mainly young men, and generally intelligent and enterprising, and, if their Bohemian style of existence had a tendency to somewhat demoralize them, they were usually faithful employes, and labored earnestly for the interests of the lines with which they were connected. That they had their faults it would be folly to deny, but their virtues also were great, and their love for their business and devotion to it was exceptional and commendable. There were undoubtedly some black sheep among them, but their failings and errors generally injured themselves more than others.

Those of them who are still connected with telegraphy generally occupy responsible positions, to which their long experience fully entitles them. Those by whom these lines may be read will recognize their truthfulness, and it is hoped will add their own experience and observation to the general fund, for the instruction and amusement of the generation which now manipulate the instruments, and has taken the positions as employes which they once held.

The writer looks back with interest and affection to the many years past, when he was one of the then limited band of telegraph operators, and to those with whom he was then associated. Nothing gives him more pleasure than to meet these old time friends, and again revive the memories of the past; and, as he recalls those who have gone from the joys, and sorrows, the successes and pleasures, and the troubles and tribulations of earth, he is saddened at the thought that he shall meet them no more in this life.

"After life's fitful fever they sleep well,"

and in a few days we too shall become but a memory of the past, and shall

"Take our places in the silent hall of death."

It is for us that remain that regret and sorrow should be felt. For those who have gone before us we should rather rejoice, because their warfare is ended. They have fought life's battle, and for them there is no further need of apprehension, of disappointment, suffering or trouble.

The telegraphs and telegraphers of the present day are unlike those which have been briefly and imperfectly depicted in these articles. In many respects there has been very marked improvement, but, in the ability and good qualities of the persons engaged in the business, the old time telegraphers will compare favorably with the generation which has succeeded them.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended January 17, 1874, was 328,946; an increase over the corresponding week last year of 45,267.

Resignation of and Presentation to Mr. Charles P. Hoag.

MR. CHARLES P. HOAG, chief operator of the Western Union Telegraph Company, of this city, having tendered his resignation, which was to take effect yesterday, as he was about to leave the office yesterday was called over to Mr. Urquhart's desk, where Mr. C. S. Cunningham, on behalf of the operators, addressed him as follows:

"Mr. Hoag—We were surprised when we heard of your determination to surrender the profession in which you have so brilliantly distinguished yourself, and grieved because we know and feel that we are losing a kind friend, and the company a most worthy chief operator. I wish my brother operators had selected one who could in words give you an adequate idea of their appreciation of you as a gentleman and an operator. During our association with you, your kind and gentlemanly deportment, your attention to your arduous duties, and your readiness at all times to consult the wishes and desires of those under you, have secured for you our love and confidence. Your even and cheerful disposition had a tendency to lighten our labors and create that harmony so essential in our profession; and we feel that when you depart we have lost a valued friend and a most agreeable associate. As a slight proof of our esteem we beg your acceptance of this chain and locket. Our only regret is that circumstances prevent us from tendering you something more valuable and worthy of the feeling which animates us. We hope you will wear it in remembrance of the happy days we have spent together—and that in your new and more responsible duties you will be equally successful in meriting public confidence and esteem. We wish you, your amiable wife and children, a long, happy and prosperous life."

Mr. Hoag, in a few well chosen remarks, thanked the operators, and concluded by saying that he had worked a long time for the company, but he would admit that this was the best "receiving" he ever did. Mr. Hoag is about to embark with his brother in the wind-mill business, an invention of their own, for which they have received a patent.—*Alta California.*

Suit Against the Western Union Telegraph Company.

THE Indianapolis *Journal* gives the following in reference to a suit for \$50,000 damages brought against the Western Union Telegraph Company by a man named Ericsson, a theatrical manager, the injury being received, as alleged, through an operator's divulging the contents of a message: "The theatre troupe over which Ericsson presided was playing an engagement at North Vernon, Ind., and became somewhat pressed for money. He telegraphed his brother for funds. The brother responded as follows: 'No money here. Hold fast to all you get. Come home. Be sure and bring my dog.' One of the company, having his suspicions aroused from some cause, came to the telegraph operator, and by representing himself as Ericsson's partner, succeeded in getting a copy of the despatch, on the strength of which he caused the manager's arrest and incarceration in the jail, where he remained for a brief interval of time. The complaint alleges that the plaintiff had in his employ a large number of 'stars,' secured at an enormous expense, was making money rapidly on account of the excellence of his company, and that upon his arrest the company disbanded, greatly to his detriment, financially and otherwise. His anguish of soul, during his stay in jail, he thought could be assuaged by the payment of a few thousands. Every item was set out with the most excruciating exactness in detail. Desirous of settling some questions of importance involved the suit in the highest courts. Mr. Wallick, the manager of the Western Division of the telegraph company, has succeeded in having the case transferred to the United States Courts of this district, where it will be decided, probably next term."

The Opposition to the Western Union Company.

THE New York correspondent of the *Daily Evening Traveller*, of Boston, Mass., writes to that paper in regard to the opposition to the Western Union Telegraph Company as follows:

"I don't believe you will be afraid to publish the fact, in this connection, that the Western Union is really menaced now by the most serious opposition it has ever encountered. A few years since this company had the Atlantic and Pacific and Franklin in its grasp, but in some way it has lost it. I think I could tell you how, but it is unnecessary. Now there is to be a struggle which will be far more serious to the Western Union than any it has yet encountered. In anticipation of this, the Western Union had already monopolized the Gold and Stock Telegraph Company, but have since almost lost that advantage by persisting in charges which brought the Manhattan Company into life, and now the American District Telegraph Company becomes an object of competition. This is a distribution telegraph by

messengers, which, I presume, your readers know all about, as you have it in Boston; but, in brief, it is the quickest and most convenient method of sending messages or packages ever invented, and, consequently, it is universally popular. The telegraph company which secures this will have an advantage in city distribution which can hardly be appreciated, except by those who have tried city despatches. The American District Telegraph Company, of New York, is the parent concern, and the District Telegraph Company, of Boston, Philadelphia, Chicago, St. Louis, etc., are offshoots. It is probable that the Western Union, from its great influence, will secure these lines, and finally incorporate them, and they are now negotiating; hence the advance of American District Telegraph stock lately."

Electricity.

WE stated, a short time since, that arrangements of an important character were pending, having for their object the development of electricity as a lighting and motive power. That this mysterious power is capable of being applied to many purposes of art, science and industry, has been already fully established, and there are yet many other purposes, at present only indicated, to which it may doubtless be applied with a success not less complete than that which has been achieved in the electric telegraph. For purposes of lighting our thoroughfares and public buildings, for lighthouses and ship lights, electricity has already shown itself to be thoroughly well adapted; and all that is required for its extended application to these purposes is that the matter should be taken up in a practical and business-like manner. In the departments of art and manufacturing industry a wide and at present comparatively unoccupied field exists for the application of this invaluable agent. In connection with the working of our railway system, with which we are more particularly interested, there would appear to be no reason why a very general economy might not be effected by the substitution of the electric light for the present expensive mode of lighting by gas. Night signals might be given by the electric light in the place of the oil and gas at present employed. Electricity is successfully employed, and may be still further extended in the communication, and for keeping accurate time on all the railway clocks; in railway trains it may be applied for purposes of railway breaks; and we believe the day is not far distant when even steam itself shall be superseded by electricity as a motive power.

Hitherto electric science has been treated too much in the nature of a philosophical toy, and its most eminent professors have been content to keep to themselves many of the brilliant results which they have obtained, and frequently overlooking, in the ardor of their scientific researches, the practical value of results which have been reached. One thing, at all events, in connection with electricity, has been fully demonstrated, which is, that it affords a cheap and efficient motive power. Enterprise has but to apply it to the many purposes to which it is adapted; but enterprise itself requires the motive power of capital. We are in a position to state that this essential has been provided. A company has been registered for the purpose of taking over the manufacture of all Sir Charles Wheatstone's inventions in electro-magnetic telegraphs, electro-magnetic clocks, mechanical clocks, with all the improvements connected with the patents. The company also take over the good will and stock in trade, and will apply the capital to be raised generally in "assisting and promoting the economic application and development of electrical power." The capital consists of the small sum of £30,000, the whole of which has been already privately subscribed. The subscribers to the capital signing the articles of association are Sir Charles Wheatstone, 19 Park Crescent, Regent's Park, W.; R. Sahne, Esq., 172 Great Portland street, W.; H. Kimber, 79 Lombard street, London; F. Braby, Mount Henley, Sydenham; Sir S. Canning, 7 Great Winchester street Buildings, W.; T. H. Puleston, 41 Lombard street, and W. Abbot, 10 Tokenhouse yard.—*The Railway News.*

Correspondence.

WE do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., Feb. 11th.

TO THE EDITOR OF THE TELEGRAPHER.

THERE has been no mention of telegraph matters in either house of Congress since my last week's letter was written. What the *Springfield Republican* humorously styles "the William Orton and Gardner Hubbard debating society," before the Senate Post-office Committee, seems to have substantially ended for the pres-

ent with Mr. Hubbard's reply to Mr. Orton's last speeches before the committee. Postmaster Burt, of Boston, Mass., favored the committee with his opinion that the messages could be delivered by the postmen as promptly as letters are now delivered, which it is to be presumed even Mr. Orton would not undertake to dispute, and this seems to have brought the performance to a close for the present. The committee has agreed to print the arguments and evidence on the subject, which will be a good thing, as private enterprise certainly would not undertake the job. Fortunately, although the committee may print, but few are compelled to read them, and so no great harm will be done. It cannot be denied that, however able and convincing these arguments and the evidence accompanying them may be, they lack the elements of freshness and novelty which would insure them a general perusal and consideration. Besides, as it is a foregone conclusion that the Hubbard scheme and Mr. Creswell's postal telegraph have neither of them any chance of favorable consideration from this Congress, there is a plentiful lack of interest in anything relating thereto. We have other fish to fry in Congress, and can't waste time upon any impracticable telegraph propositions now. Having got their arguments before the Senate Committee and printed, Mr. Hubbard and Mr. Orton can retire with the consciousness that their duty has been discharged, and that a grateful constituency will hold them in remembrance until the next session.

Mr. Orton's prestige has been rather damaged by the demonstration of the Automatic Telegraph System recently made, the details in regard to which have been printed in circular form and generally distributed here, and were also printed in the *Republican* yesterday morning. The inaccuracy of his statements and assertions in regard to the Automatic System, in his letter to the Postmaster General, were so completely and practically demonstrated on this occasion, and that, too, in the very presence of his friend and electrical guide and councillor, Mr. G. B. Prescott, that he must feel rather chagrined at having been led to make them in so positive a manner. As he must realize, from the mortifying position in which he has been placed, first in regard to the Duplex and now in regard to the Automatic, it isn't safe to decry and denounce telegraphic and electrical inventions and systems because they do not exactly accord with your interests and prejudices for the time being.

Mr. William L. Ives, of Seneca Falls, N. Y., has been appointed by the President of the Senate operator in the Senate wing of the Capitol, on the line connecting the Capitol and the several Government Departments.

The Secretary of War has transmitted to the House of Representatives, with a request that it may receive early attention, a communication from the Chief Quartermaster of the Military Department of Arizona, which states that, "In view of the fact that there is no law, national or territorial, affixing a penalty beyond that for a misdemeanor, for tampering with the military telegraph lines, and in view of the fact that the territorial legislature will not convene for over a year, the propriety of requesting the action of the proper authority, looking to the necessary legislation on the subject by the present Congress, is respectfully suggested for the consideration of the commanding General."

This is approved and forwarded by General Crook, commanding the Department, who adds a recommendation that Congress be requested to pass an act affixing penalties equal to the severest imposed by any of the State Legislatures for this offence, and offering suitable pecuniary rewards as an inducement to all parties to discover and deliver up any persons who tamper with the wires in the territory.

The communication was referred to the Military Committee and ordered printed. CAPITOL.

The Claims of the Page Patent.

NEW YORK, February 9.

TO THE EDITOR OF THE TELEGRAPHER.

WILL you please enlighten me as to what is claimed by the Page Patent, mentioned so frequently in your very interesting columns. Having been "disconnected" from telegraphy for upwards of eighteen years, is my only excuse for making an inquiry that may seem ridiculous to most of your readers, but the patent was certainly not well known when I had the pleasure of being an operator. NI.

Answer.—The following are the claims of Prof. Page, as contained in the patent issued to him under date of April 14, 1868:

1. An induction coil apparatus, consisting of a primary and secondary circuit, when said secondary circuit is many times (that is to say, two, three or more times) the length of the primary circuit, having the connections so arranged that shocks, sparks, and electro-static results may be obtained from the secondary circuit alone, or from the combined primary and secondary circuits, or from the primary alone, or from portions of either circuit, substantially as set forth.
2. The combination of an automatic circuit breaker with either a primary coil alone, or a primary and secondary coil combined, substantially as set forth.

3. The combination of a mechanical circuit breaker with a primary and secondary coil combined, substantially as set forth.
4. The combination of both a mechanical and automatic circuit breaker with a primary and secondary coil combined, substantially as set forth.
5. The combination of a primary and secondary coil, enclosing an electro-magnet, with an automatic circuit breaker, substantially as set forth.
6. The combination of a primary and secondary coil, enclosing a compound or divided electro-magnet, with an adjustable automatic circuit breaker, substantially as set forth.
7. The combination of a primary and secondary coil, enclosing a compound electro-magnet, with an attached hammer circuit breaker, substantially as set forth.
8. The spark arresting circuit breaker, whether used with a primary coil alone or a primary and secondary combined, substantially as set forth.
9. The spark arresting circuit breaker, whether used with a coil or coils enclosing an electro-magnet, substantially as set forth.
10. The spark arresting circuit breaker, whether attached to or independent of the primary or primary and secondary coils, substantially as set forth.
11. The adjustment of the retractile force of an automatic circuit breaker, substantially as set forth.
12. In combination with such adjustment, I claim adjusting the distance of the hammer, or the armature, from the pole or poles of the electro-magnet which actuates them, as set forth.
13. Adjusting or regulating the length of vibration of the circuit breaking bar by means of a set screw, or any mechanical equivalent for substantially the same purpose, substantially as herein set forth.
14. The employment of one electro-magnetic instrument to open and close the circuit of another electro-magnetic instrument, using either one battery for both or separate batteries for each, substantially as set forth.
15. The employment of separate and independent batteries to operate an electro-magnetic circuit breaker, and the circuit which is broken by it, substantially as set forth.

These claims were reviewed and examined in THE TELEGRAPHER of February 25th and March 4th, 1871. On the 10th of October, 1871, the patent was reissued to Mrs. Priscilla Webster Page, administratrix of the estate of Charles Grafton Page, deceased, assignor to the Western Union Telegraph Company, New York. The first ten claims of the reissue are identical with those in the original patent. The remaining and important claims of the reissued patent are as follows:

11. The adjustment of the retractile force of an automatic circuit breaker, substantially as set forth.
12. The combination of an electro-magnet, armature and adjustable retractor.
13. Adjusting or regulating the length of vibration of the armature of an electro-magnet by means of a set screw, or any mechanical equivalent for substantially the same purpose, substantially as herein set forth.
14. The employment of one electro-magnet to open and close the circuit of another electro-magnet, using either one battery for both or separate batteries for each, substantially as set forth.
15. The employment of separate and independent batteries to operate an electro-magnetic circuit breaker, and the circuit which is broken by it, substantially as specified.

These claims of the reissued patent, as above, were printed in THE TELEGRAPHER of October 14, 1871.—[EDITOR OF THE TELEGRAPHER.]

Death of Mr. Charles F. Simmons.

SAN FRANCISCO, CAL., February 1.

TO THE EDITOR OF THE TELEGRAPHER.

FOR two or three weeks past I have looked for some notice in your paper of the death of an old telegrapher, hoping that some one of his numerous friends would send some word to you, but as none seem to take sufficient interest, I, who have been associated with him for a number of years, venture to do so.

Mr. Charles F. Simmons, a native of Poughkeepsie, N. Y., died December 22d, 1873, of aneurism of the heart, after an illness of four days.

Mr. Simmons came to this city in 1859 with Mr. Wm. Blanchard, under an engagement with Messrs. Lovett, for the purpose of introducing the combination printing telegraph instrument.

He was subsequently employed in the Western Union office for several years, and in 1865, upon the organization of the San Francisco Fire Alarm Telegraph, he was appointed operator, where he remained up to the time of his death.

F. G. WOOD,

Operator Fire Alarm and Police Telegraph.

A Presentation.

TO THE EDITOR OF THE TELEGRAPHER.

MR. E. P. ADAMS, who for fifteen years has served the Grand Trunk Railroad and Montreal Telegraph Company at Gorham, N. H., has been offered and has accepted the position of Agent on the Central Pacific Railroad, at Corinne, Utah. On the eve of his departure, December 24th, a goodly number of his friends, employés of the Grand Trunk Railroad and citizens of Gorham, surprised him at his office, where he was presented with a magnificent Swiss gold watch, valued at \$160, by Thomas Giffard, Esq., for the donors. The closing lines of his very appropriate speech we will insert:

"MR. ADAMS.

"We are sorry to hear that you are about to leave us for the distant West. Yet, as we hope the change may be for the benefit, physically, of yourself and dear companion, and also your financial benefit, we will not

bid you remain, and shall always be glad to hear of your prosperity; but should you ever return, we will be ready to welcome you with warm hearts and open hands.

"As a token of our friendship please accept this watch—not for its intrinsic value, but rather as some tangible expression of the esteem in which you are held by these your friends. As you look upon it day after day, to remind you how time is passing, may it remind you of the many happy days we have spent in your society, and that among the old Granite Hills, and those other places here represented, you have left behind many true and admiring friends.

"Let me also assure you, sir, that we will miss you. Yes, we will miss you when you cease from our society, as if a calm familiar star shot suddenly and brightly from our vision; we will gaze wistfully down the path where you have vanished, and in the long after-time *our hearts*, which you have helped to make happy, will recall your memory with gratitude and tears."

Mr. Adams then responded in a few terse and pertinent remarks, followed by several speeches of regret that he was about to leave them, and all united in wishing him prosperity and happiness in his new home. W.

A Bullock.

DIXIE, February 4.

TO THE EDITOR OF THE TELEGRAPHER.

THE following office messages passed through my hands to-day. I believe they will explain themselves to the intelligent telegrapher:

"To Vicksburg, Miss., Ofs.

"Give better address, yours 3d to Capt. H. H. Broadstearnes, signed Cooper. Can't find party.

"Selma, Ala., Ofs."

"To Selma, Ala. Ofs.

"Destroy it. The message goes to Capt. H. H. Broad, steamer Selma, at New Orleans.

"Vicksburg, Miss., Ofs."

The message was originally sent to New Orleans direct. Q. CLUCKS.

Answers to Correspondents.

SILVER STATE.—Your favor of January 31st received, and amount appropriated as directed. There is no doubt about the writer being a female.

Personals.

MR. HARRY I. TALLEY, telegraph operator, Germantown Junction, Philadelphia, Pa., desires to learn the present address of Mr. FRANK B. SCHALL, telegraph operator, who left New York last June. Any one who can give the desire information is requested to address as above.

MR. CHARLES P. HOAG has resigned the situation of chief operator of the San Francisco, California, Western Union office, to engage in other business.

MR. JOHN R. YONTZ has been appointed chief operator of the San Francisco, California, Western Union office, in place of CHARLES P. HOAG, resigned.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended January 20, 1874, and bearing that date.

No. 146,603.—ELECTRIC BELL STRIKING APPARATUS.—Lewis H. McCullough, Richmond, Ind., assignor of two thirds his right to Elwood Patterson and Isaac G. Dougan, same place. Application filed September 4, 1873.

Hammer held suspended against force of one spring by action of another spring or weight, exerted through a train of gearing held by the armature of a magnet taking against a detent. The train released, the hammer is instantaneously thrown against the gong by the one spring, and then raised by the other through a sectional gear and a rack pinion.

1. A bell, hammer and detent, in combination with a prime mover for raising the hammer, and a spring for discharging it, the opposing forces being nearly balanced when the hammer is held suspended, so as to reduce the pressure on the detent to a minimum.

2. An alarm bell in which the hammer is lifted against the force of a spring, and thus held suspended by clock work, ready to deliver the blow.

3. An alarm bell in which, during each beat of the work, the hammer delivers a blow, and is also again lifted and held suspended for another discharge.

4. The combination of the segmental pinion B of suitable clock work, rack A² on the stem of the hammer, spring C, revolving stop pin f and armature G of an electro-magnet, substantially as and for the purpose specified.

5. The combination of the rack A² on the stem of the hammer, spring C, pinion B, revolving stop pins f and f', and armature G, provided with a notched lug, g g', substantially as and for the purpose set forth.

6. The spring cushion E, in combination with the shouldered stem A¹ a² of the hammer, substantially as and for the purpose specified.

7. The loose fly wheel K, in combination with the segmental pinion B of the clock work, and rack A² of the hammer, substantially as and for the purpose specified.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, FEBRUARY 14, 1874.

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PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of **THE TELEGRAPHER** will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The TENTH VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the

TELEGRAPHIC FRATERNITY,

whose organ it is and will continue to be. It is a thoroughly

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(P. O. Box 5503.) NEW YORK.

Rumors of Future Telegraphic Combinations.— How a Consolidated Opposition may be Profitably Managed.

ALTHOUGH there is for the time apparent quiet and stagnation in telegraphic matters, there is a rather instinctive feeling that this condition of affairs is not to continue for a very long time. Foreign capitalists are said to be looking with considerable interest into the telegraphic situation, and to be ready to invest their surplus capital in acquiring an interest in and extending the telegraphic system of this country. It was understood and reported at one time that it was intended, and steps had been taken towards acquiring a controlling interest in the Western Union Company, but this, it was subsequently admitted, had been abandoned, and it is since confidently believed in certain quarters that they are making arrangements, in connection with the United States direct cable scheme, to consolidate and extend the existing telegraph lines outside of the Western Union combination, as has been advocated and urged for years, as the only safe policy for the opposition. We are not prepared just yet to state how far matters have been arranged, but we shall be disappointed if something does not come out of this more than mere talk and buncombe.

The extract from the New York correspondence of the *Evening Traveller* of Boston points to this new combination to advance telegraphic competition, and indicates that the scheme is beginning to be made public. That there is an excellent field here for such an enterprise there can be no doubt, and the time is fully ripe for it. The first step, of course, must be the consolidation under one management of the companies and lines now competing with the Western Union, and then the extension of the system, so as to enable it to compete on something like equal terms for the telegraph business of the country. The amount of capital that would be required to obtain a controlling interest in the existing opposition companies, if judiciously invested, would not be very large, comparatively speaking, and with such pecuniary results as may be obtained by the extension of the system, and an energetic and liberal, and at the same time economical management, we know of none which would be more likely to attract the attention of intelligent and enterprising capitalists.

The prediction of Mr. ORTON, in his report to the stockholders of the Western Union Company, that at an early day there would be practically no competition with that company, is not likely to prove as correct as it was gratifying to those of them who were inclined to credit it. Competition there will be, unquestionably, the only query being whether it shall be an active, vigorous and aggressive one, with the means to meet its competitor on at least equal terms, or a comparatively feeble and half exhausted affair, which shall just manage to exist, as has been the case for much of the time during the past few years. This question is, we believe, to be practically decided very soon, and we think, from what we can gather in regard to the situation, that it is likely to prove the former.

That it is now intended to lay the new cable which is being manufactured in England we think there is conclusive evidence. That it will, if laid and worked direct, prove a formidable rival to the Anglo-American Company, we do not believe, as the amount of business which can be transmitted over so long a circuit, and by a single cable, must be very limited. Still, if it is laid, it will need a more complete telegraphic system than there is at present to collect and distribute business for it. Naturally the question arises, on the part of those engaged in this enterprise, how such a system may be provided, and there can be but one solution to the problem, and that the one we have so often pointed out.

We should prefer that the ownership and control of the competing lines should remain in the hands of our own people, but if it has been demonstrated that foreign capital must be called upon to supplement that already invested to complete the work, we must submit as gracefully and cheerfully as possible to the inevitable.

The consolidation of the existing companies and interests into one organization, and the extension of the system so as to make it really national in its character, will afford an opportunity, which we hope will be improved, to thoroughly revise the existing system of management, and introduce an improved system, which shall be more in accordance with common sense, and benefit by the lessons which the past and present experience of all telegraph companies and lines in this country teach. There should be a thorough and systematic organization of the whole machinery of the consolidated company, such as is calculated to insure efficiency, economy, and a proper administration of every branch of the business. The electrical and engineering portion of the business should be assigned here, as it is in Europe, to persons who are properly qualified to administer them intelligently and properly. The General and District Superintendents have all that they can attend to properly in managing their operating and business departments—and, even if qualified to supervise or direct the electrical and scientific branch, which they seldom are, have not the time to attend to them properly.

There should be a chief electrician and engineer, who should have charge of all matters which properly belong to that department. He should be carefully selected, and appointed only upon his ability and fitness for the position, and should have an assistant in each division, who should be accountable to him and report to him. These should not be interfered with by or accountable to the Superintendents, who properly are only the business managers of the lines and offices, and who can always find abundant and profitable employment in the discharge of their legitimate duties. Being relieved from other duties, these electricians and engineers would be able to devote their time to devising and determining upon the best and most advantageous methods of construction and insulation of lines, the proper and most efficient and economical arrangement of circuits and batteries, decide upon any improvements which may be made or proposed in telegraphic instruments and apparatus—in short, perform all the duties which in Europe are considered as especially belonging to that position which it is proposed to create, and which has never heretofore been fully established upon any American line. This is a most important matter, and one which should receive careful consideration if it is desired to avoid the errors and profit by the experience of the past.

To the District Superintendents should be given the entire business management of their respective districts. They should have the appointment of all managers of offices, who should be directly responsible to them, and they in their turn should be responsible to the General Superintendent, whose responsibility would be, of course, to the Executive of the company. A simple and easily comprehended system of business and accounts should be established, doing away with as much of the complicated machinery of the Western Union organization as possible. While it is desirable that a certain amount of statistics in regard to the business shall be obtained and preserved, there is danger that this may be carried to excess, and that more time, labor and expense may be invested in this direction than is profitable. This should be carefully guarded against, and at the same time care be taken that all the necessary statistical information is obtained and properly tabulated for information and use.

With such an organization as we have hastily sketched there can be no doubt but that the new organization would prove practically and pecuniarily successful. Much money is constantly squandered on the telegraphs which could be saved with a little knowledge and care—and by a judicious and liberal outlay in directions where it is sadly needed, the chances and percentage of profit would be largely increased.

If there is to be a new deal, and a reorganization of the lines outside of the Western Union combination, we hope that it will be thorough and practical, and that the errors and follies which have in the past, time and again, wrecked promising telegraphic enterprises, may be avoided, and that, profiting by the lessons of

experience, we may see for once telegraphic enterprises organized, managed and conducted on honest, sensible and practical business principles. That an enterprise so organized and conducted would prove advantageous and remunerative to all concerned—the investors as well as the public and the employes—there can be no doubt. The time and opportunity for it has come; now let us have it as speedily as possible.

Another Atlantic Cable Telegraph Company Proposed.

By a despatch to the Associated Press from London, which we print in another column, we learn that a prospectus has been issued in that city for a new telegraph cable, to be laid from the English coast to Halifax, N. S., via the Azores Islands. The cable proposed to be laid is a light one, and if it is to be provided and put down for the amount of capital stated in the despatch, we should judge that it must be a very light one indeed. This new company makes a bid for public favor by stating its intention to transmit messages on its cable for one shilling per word. While this would undoubtedly, when laid and in operation, secure the line an abundance of business, it will not be very likely to induce very liberal subscriptions to its capital.

No names are mentioned in connection with this new project, so that we are unable as yet to state by whom it is engineered, or upon what ground it expects to be able to do the business at 25 per cent. of the amount now charged by the Anglo-American Company for similar service. We shall have to wait the slower communication of the mails to learn the particulars of this new enterprise, which seems to have been sprung upon the public.

The *Railway News*, of London, of the 24th ult., in an article on the pecuniary condition of the company and the quotations of Anglo-American shares, which, notwithstanding the increased receipts of the company on its business, which for 1873 were £64,000 in excess of those of the previous year, had been depressed, says: "The only cause operating to depreciate quotations appears to be the circulation of rumors, to which we alluded last week, as to the formation of competitive schemes for laying light cables—a bugbear constantly raised by speculators."

The *Railway News* makes some statements in regard to these proposed light or hemp cables, which do not indicate much probability of any continued success, even if the necessary capital could be obtained to manufacture and lay them. Our contemporary, the *New York Commercial Advertiser*, which is usually conspicuously sound and sensible upon telegraph matters, leads off in a glorification of this new scheme, and an anticipation of the advantages which are likely to be derived from it, which we cannot but regard as rather premature. We would commend to its editor, and others of the fraternity who may think they perceive in this enterprise the approach of the ocean telegraphic millennium, the following extract from the article of the *Railway News* referred to above:

"As bearing upon this question of the proposed hemp cables, it may be useful to inform those who consider that there may be some probability of their being laid and worked with success, to state that a cable of this description was laid some time since between Cornwall and the Scilly Islands, and its existence was limited to a few short hours. On another occasion a similar cable was laid between England and Ireland. Its span of life, too, was short—not more, we believe, than three days. Both of these cables have been replaced by heavy ones, and they are now in as perfect a condition as when they were first laid, and without having been interrupted, or required the outlay upon them of a single shilling. If there were really any merit in these so-called light cables, it would have been to the interest of the Telegraph Construction Company to have manufactured and laid them; and if taken in hand by such a company, the public would at least have the guarantee, which cannot be provided elsewhere, that the work would be efficiently done, and the cable manufactured under the supervision of really practical men."

We believe there is no instance on record where light ocean telegraph cables have remained in condition to be worked for more than a few days at a time, while

the heavily armored cables have proved efficient, reliable and remunerative.

We shall await with some curiosity the further developments in regard to this latest proposed cable telegraph enterprise, and, until they are received, will not express an opinion as to its character or the purposes for which it is initiated.

The Recent Test of the Automatic Telegraph System.

WE published last week a brief statement of the test of the demonstration made on Tuesday evening, January 27th, of the Automatic System of Telegraphy, on the line of the Automatic Telegraph Company between New York and Washington. As a matter of record we print this week the report of the General Manager of the company to the Hon. GEORGE HARRINGTON, its President, giving the details of the demonstration in full, with the certificates of a number of gentlemen present at either end of the line, of the correctness of these details.

The occasion of this demonstration was to show the inaccuracy of the statements made by President ORTON, of the Western Union Telegraph Company, in his letter to the Postmaster-General under date of Dec. 27, 1874, which were, that

First. The Automatic System is practically slower than the Morse.

Second. It requires at least five times as many operators to do the same amount of work within a given time.

Third. That, consequently, it is more expensive.

Mr. GEO. B. PRESCOTT, the electrician of the Western Union Company, was present on behalf of that company in the New York office, and Mr. LEONARD WHITNEY, Manager of the Western Union Company in that city, in the Washington office.

The matter selected was the same as that previously transmitted over eight Western Union wires, against a single Automatic wire between the two cities.

The following are the documents referred to:

General Office of the Automatic Telegraph Co., }
66 Broadway, New York, }
January 28th, 1874. }

Hon. GEORGE HARRINGTON, President.

SIR—I respectfully submit the following report of the work done in the demonstration made on Tuesday evening, January 27th, as per your instructions of prior date. The matter selected for the purpose was the President's late message and the Spanish protocol:

<i>Statement.</i>	
Matter transmitted,.....	11,130 words.
Length of Circuit,.....	281 miles.
Conductors used,.....	1 wire.
Labor.—New York.....	{ Morse operator,..... 1
	{ Copying operatives, . . . 13
“ Washington... }	{ Morse operator 1
	{ Perforating operatives, 10
Total, 25 operatives.	
Time.—	P. M. Mins.
Washington. { Perforating commenced, 5.39 }	45½
	{ Perforating completed, 6.24½ }
New York. { Copying commenced, . . . 5.42 }	66
	{ Copying completed, . . . 6.48 }
Total time, 69 minutes.	
Cost.—Morse operators,.....	\$100 per month.
“ Automatic operators,.....	40 “ “

The characters were perfectly legible and well defined, and were copied with great facility.

The average time during which the perforating operatives were actually at work was forty-five and a half minutes—making an average per operative, per minute, of twenty-five words.

The average time of copyists was fifty minutes, making an average per copyist, per minute, of seventeen words.

Unlike the Western Union Company, we had no large corps of operators from which to select our working force, but were compelled to utilize all—good, bad and indifferent, which makes it proper to call special attention to the above averages made.

The whole time consumed was sixty-nine minutes, as against the published record of seventy minutes by the Western Union in their late effort.

The average time occupied by Automatic was fifty-five and a half minutes.

The average time occupied by Western Union (as reported) was fifty-nine minutes.

An unfortunate defect in the paper caused much de-

lay in the transmission, otherwise still less time would have been consumed. No attempt, however, was made to attain a high speed of transmission on this occasion, as that point had already been yielded, and incontestably proved in the presence of the Hon. Jno. A. Creswell, Postmaster General, and numerous other gentlemen, including Senators and Representatives in Congress, on the evening of December 11th, 1873, when we transmitted some 12,000 words over our one wire from Washington to New York in twenty-two and a half minutes.

Our operatives were congregated at Washington and New York on Monday, January 26th, and were tested for the first time on the evening of that day. I call attention to this, in anticipation of the charge that the time which has elapsed since the publishing of the message, has been improved by our operatives in practising upon it.

With the experience gained in this demonstration, I am confident that in another we could readily dispense with at least two perforators and three copyists, and yet perform a like amount of work.

Respectfully,
E. H. JOHNSON,
General Manager.

New York, January 28, 1874.

We were present in the office of the Automatic Telegraph Company last evening, whilst they were receiving the President's message and the Spanish protocol from Washington.

At 5.39 P. M., Washington signaled that the perforating had commenced.

At 5.43 the first portion of the message was received and handed to the copyists.

At 6.42 the last portion was received.

At 6.48 the copying was finished; the whole time occupied being 69 minutes.

There were 13 copyists in the room; but we noticed that two or three were unemployed a portion of the time, so that, had all been constantly employed, there would have been several minutes saved in the aggregate.

The writing was perfectly legible, and the copyists translated with great facility. (Signed),

JAS. G. SMITH, A. G. Supt. A. & P. & F. In Tel. Cos.
H. G. PEARSON, Assistant Postmaster, N. Y.
EDWARD W. SERRELL, C. E.
JAMES H. WILSON (of Winslow & Wilson).
HIRAM BARNEY.

Office Automatic Telegraph Co., }
Washington, D. C. }

E. H. JOHNSON, Esq., General Manager.

At the test which took place on Tuesday evening, January, 27th, the late annual message of the President, together with the Spanish protocol, amounting in all to eleven thousand one hundred and thirty (11,130) words, was perforated by ten perforators, and transmitted automatically, by one Morse operator in the following time:

Perforating commenced, 5.36 P. M.	
“ completed, 6.21½ “	
Time, 45½ minutes.	
Transmission commenced, 5.40.	
“ completed, 6.39.	
Time, 59 minutes.	

The above is New York time, as computed by Washington Observatory time.

Respectfully,
P. B. DELANY, Manager.

Having witnessed this test throughout, we can certify to the correctness of the above statement.

(Signed),
ROBERT D. LINES (of Post Office Department).
D. J. GIBSON, U. S. A., Acting Signal Officer.
H. W. HOWGATE, U. S. A.
J. H. LATHROP.

Quick Cable Telegraphing.

THE perfection to which the cable telegraph service has been brought is shown by the following facts, which can be proved to be such:

In December last a message was sent from New York to London, and in *thirty minutes*, actual time, the answer was received in New York. On Thursday the 5th instant, another despatch was sent to London, to which a reply was received in *thirty-five minutes*, actual time. In neither of these cases was any especial effort made to hurry the answers, but the party addressed sent the reply to the London office by the messenger delivering the original message.

To fully appreciate the wonderful achievement we must consider that the distance from New York by the land lines, from New York to the cable station at Heart's Content, N. F., is about 1,300 miles, the length of the cable about 2,000 miles, and the land lines and cable from Valencia to London about 300 miles. Each message, therefore, was transmitted about

3,600 miles, and passed through the hands of eighteen persons, all told; consequently, the message and reply, in each case, passed through the hands of thirty-six persons, and travelled over 7,000 miles in thirty to thirty-five minutes. We do not think that this can easily be beaten, and the progress made within the last fifteen years, in the facilities for communication between countries so widely separated, is truly marvellous.

An Excellent Appointment.

By the recent death of Mr. JOHN FOLEY, Manager of the Atlantic and Pacific, San Francisco, California, office, a vacancy was created, which, we are much pleased to learn, has been filled by the promotion of Mr. L. N. JACOBS to the position. This is an excellent appointment, and one which we have no doubt will prove advantageous to the telegraph company and the public, as well as gratifying to the many friends of Mr. JACOBS. This gentleman is no stranger to the readers of THE TELEGRAPHER, who will be pleased to know that his ability is being appreciated and rewarded.

Electric Watch Clocks and Dials.

The Howard Watch and Clock Company, of Boston and New York, whose advertisement will be found in our advertising columns, are doing an extensive business in magneto-electrical telegraph instruments, and in electro-magnetic watch clocks, chronographs, astronomical clocks, etc.

Mr. JAMES HAMBLET, the electrician of the company, is well known as an able and experienced scientific and practical inventor, and gives his personal attention to all the electrical work of the company. This company have just finished and delivered to the United States Observatory at Washington eight astronomical clocks, to be used by the scientific expeditions sent out by the United States Government to observe the great astronomical event, the coming transit of Venus.

In this city they have recently put up in the Hoffman House an electro-magnetic watch clock, with twenty stations; also a similar clock in Mr. J. U. BRIGGS & Co.'s extensive stables, with five stations. They have also just finished putting into the new depot of the Boston and Lowell Railroad a watch clock with two stations, and a standard clock which actuates seven electric dials in different parts of the building.

The American Fire Alarm Telegraph.

Messrs. GAMEWELL & Co. have just completed the fire alarm telegraph for Harrisburgh, Pa., and are now engaged in putting up their system under contract with the municipal authorities at Halifax, Nova Scotia. Their system has distanced all competitors, and they are now practically without opposition in the business which has been created by their enterprise, liberality, and fair dealing.

The Claims of the Page Patent.

At the request of a correspondent we reprint in another column the claims of the original and reissued patents of Prof. PAGE, which will be of interest at the present time, when an attempt is being made to establish judicially the validity of the patent, which, as will be seen, in effect covers almost every description of electrical and telegraphic apparatus.

The Telegraph.

Progress of the Southern and Atlantic Telegraph Line.

THE Southern and Atlantic Telegraph Company have actively recommenced the extension and construction of its lines. The section between Selma and Mobile, Ala., upon which the poles have been set and the insulators put on, is being wired, and will shortly be completed and in operation to the latter important point. It is understood that this company is meeting with very encouraging success, and that the extension of its lines south is watched with interest and cordially welcomed by the people of that section, who have hitherto been entirely dependent upon the Western Union Company for telegraphic facilities.

By Cable.

A CABLE STEAMER ADRIPT.

LONDON, Feb. 7.—The steamship Ambassador, laden with a section of the Brazilian cable, broke from her moorings at Woolwich yesterday, and was carried some distance up the Thames before the crew succeeded in securely anchoring her. While the steamer was adrift she fouled thirty-two colliers, sinking two of them and damaging others. Several of the men on the colliers were severely injured.

PROJECT FOR A NEW TELEGRAPH CABLE FROM EUROPE TO AMERICA.

LONDON, Feb. 9.—The organization of a new company to lay a light cable from the coast of Great Britain to Halifax, via the Azores Islands, is announced.

The capital is \$380,000, and the prospectus, which was brought out on Saturday, says it is the intention of the company to convey messages over its cable at the rate of one shilling per word.

The American District Telegraph.

THE rapidity with which the American District Telegraph Company has increased in popular favor is certainly astonishing.

Scarcely two years ago the company started off with every prospect of success, but laboring under the disadvantage of unprofitable rates, and the imperative necessity of keeping a large force, the company for a time seemed to linger between life and death. Through the influence, ability and indefatigable perseverance of Mr. E. B. Grant, the present Vice-President, and the hearty cooperation and incessant labors of the Superintendents the company has gradually risen to its present sphere of usefulness. Its prospects at the present time could hardly be more favorable, and with a liberal policy the company will meet with a success in the future hardly anticipated. Satisfactory arrangements have been completed with the City Fire Alarm Telegraph Department, that enables the company's subscribers' signals for fires to be transmitted to the Department without repetition, should the fire prove to be of such magnitude as not to be conquered by the extinguisher carriages of the company. Fortunately all fires thus far have been subdued without the aid of the Department, although several have necessitated the calling of help from the adjacent districts.

The understanding with the Police Department is also quite satisfactory, and arrangements will undoubtedly be consummated within a short time that will largely increase the efficiency of both the city's and the company's forces.

The patrol force of the company is to be extensively increased. In the Fifteenth District, 397 Broadway, over one hundred new subscribers were added last week.

Patrol boxes are being placed in position as fast as possible, from which the night patrolmen will send signals every hour. The patrol force in this district is to be immediately increased by the addition of eight or ten men. This same system is to be carried into every district. To a certain number of districts will be assigned a roundsman. This officer, in connection with the boxes and other safeguards which will be brought out in the establishment of this system, will insure a perfect and reliable patrol force. The company have in circuit 2,300 instruments, paying a monthly rental of \$2.50. The earnings of these instruments additional to the rental is—Messenger Police and Fire Service, average \$250 per day, including Sundays. The receipts for service have reached as high as \$500 in a single day. The number of signals or "calls" average about 1,100 per day. The expenses of the company are necessarily large. To perform the service in a satisfactory manner requires a regiment of uniformed and disciplined boys, an extensive police force, efficient apparatus for extinguishing fires, a large construction and maintenance force, etc. It should be understood, however, that the increase of subscribers does not increase the operating expenses in the least, excepting in the matter of messengers, the present force being sufficient for treble the number of subscribers.

Foreign Telegraphic Notes.

THE report of the directors of the Eastern Telegraph Company states that they have at length concluded a joint purse traffic arrangement with the Indo-European Telegraph Company. The net revenue for the six months ended the 30th of September, amounted to £122,826, and an interim dividend of 1½ per cent. on the 14th of October, and a further interim dividend of 1½ per cent. declared on the 7th inst., amounting, together with interest on new shares, to £99,932, leaves a balance of £22,893 to be carried forward.

At an adjourned meeting of the shareholders of the West India and Panama Telegraph Company, at the

offices in London, the following gentlemen were elected directors in place of the old board, which had resigned: Sir James Anderson, Messrs. H. Weaver, C. W. Earle, W. Ford, Cyrus W. Field and H. Holmes. The chairman stated to the meeting that he had received a letter from the Telegraph Construction Company, which conveyed the intelligence that the cable at Porto Rico was about being buoyed.

The Telegraph in China.

THE Great Northern Telegraphic Company has recently established a line between Woosung and Shanghai. Twenty words are sent for a dollar. This is the first successful attempt to introduce the telegraph through the main portion of the empire, as previous efforts have been met with violent opposition from the people, who cut the wires and destroyed the poles.

Telegraphic and Electrical Brevities.

THE Government of the United States has given permission to the Mexican Government to extend its telegraph lines across the Rio Grande to Brownsville, Tex., and to establish an office there. When this is accomplished there will be direct telegraphic communication established between all points in the United States and the City of Mexico.

The annual meeting of the Dominion Telegraph Company of Canada was held at Toronto on Wednesday last, the 11th inst.

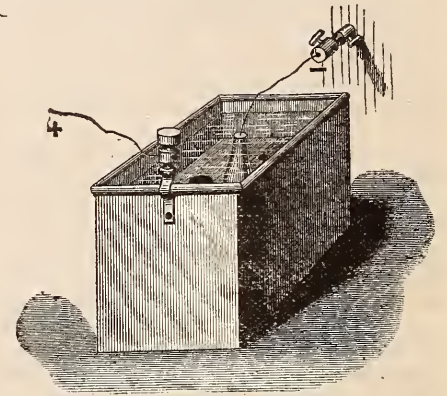
What all telegraphers should do—subscribe for and read THE TELEGRAPHER.

Married.

MEYER—PFEIFFER.—At the residence of the bride's parents, February 1st, 1874, by the Rev. Father BOSCO, A. LEONARD MEYER, agent and operator of the Southern Pacific R. R. at Santa Clara, Cal., to Miss LIZZIE PFEIFFER, of that place.

WILLIAM BROWNLEE,
Dealer in
CEDAR TELEGRAPH POLES,
DETROIT, MICHIGAN.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY. PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5603.)

38 VESEY STREET, N. Y.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

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BATTERIES, TOOLS,
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Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLETT'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND
UNION BRAND EXTRA QUALITY.

JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS.

KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

Western Electric M'f'g Co., Chicago.

LECLANCHÉ BATTERIES.

CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY CO.,

No. 40 West 15th Street.

New York, October 11, 1873.

TELEGRAPH POLES.

Parties who are in want of good

CEDAR TELEGRAPH POLES,

can obtain them on favorable terms, and have them delivered at any Lake Port between Oswego and Chicago, on the opening of Navigation, by applying to

A. A. COLBY,

P. O. Box 1,376,

TORONTO, ONTARIO,

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OUR PROFITS HAVING BEEN AMPLE,

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ALL WHO NEED

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- " " AMERICAN COMPOUND WIRE.
- " " JONES' LOCK SWITCH BOARD.
- " " ROBERTSON'S BATTERY INSULATOR.
- " " HILL'S GRAVITY BATTERY.
- " " HILL'S HOTEL ANNUNCIATOR and FIRE ALARM.
- " " McPHERSON'S IRON BATTERY.
- " " THE AMATEUR TELEGRAPH APPARATUS.
- " " PUTT'S MECHANICAL INSTRUMENTS.
- " " KENOSHA INSULATOR.
- " " BROOKS' "
- " " UNITED STATES ELECTRIC GAS LIGHTING COMPANY.
- " " POPE'S RAILWAY SIGNALS.
- " " EAGLES METALLIC (RESERVOIR) BATTERY.
- " " SELDEN'S PRINTERS.
- " " ANDERS' MAGNETIC DIAL AND PRINTER.

IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3.....\$4 00
- A WELL FINISHED AND GOOD WORKING SOUNDER, No. 4..... 3 00
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Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

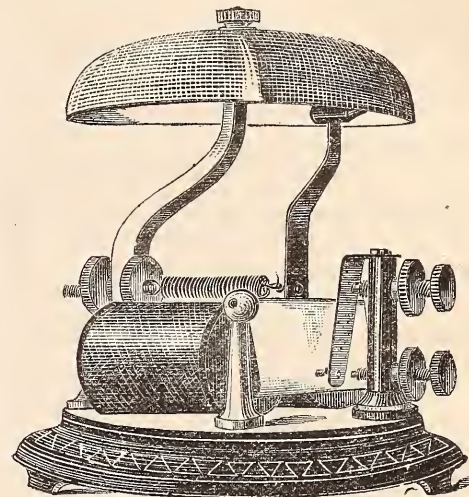
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132 WILLIAM STREET (rear),

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One half of actual size

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PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard. Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00

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Improved Switch Keys, from..... 3 00 to 5 50

Send for Illustrated Circulars.

The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

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MANUFACTURERS AND DEALERS IN

Electrical and Telegraph Instruments.

A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS

CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,

INSULATORS, BRACKETS.

PATENT ELECTRIC WATCH-CLOCK

THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection

MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS.

AND PRICES EXTREMELY LOW.

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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
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Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
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Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
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Portland, Maine,
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Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
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Taunton, Mass.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The Automatic Signal Boxes.

Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM

AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original FARMER & CHANNING PATENTS, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH
INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
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P. O. BOX 496.

A MERICAN COMPOUND
TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

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OFFICES:

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This Instrument is offered to the public as the oldest, most rapid, and best.

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in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,

which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS

of all kinds,

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REGULATORS,

ETC., ETC.,

OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
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OF

EVERY DESCRIPTION,

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NEW AND SUPERIOR PATTERNS OF

STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,

SOUNDERS,

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KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.

Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL
TELEGRAPH APPARATUS,

For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, *nearly 2,000* have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
Two sets of Instruments, etc..... 12 00

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MANUFACTURERS OF

UNRIVALLED MORSE INSTRUMENTS,

CHAMPION LEARNERS' APPARATUS,

with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,

Improved Curved Keys,

Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

DR. L. BRADLEY,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

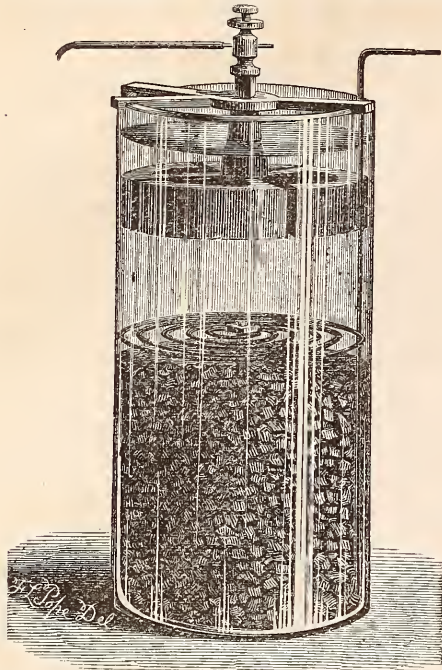
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

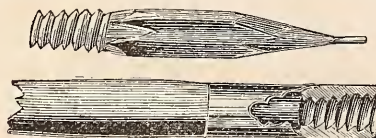
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

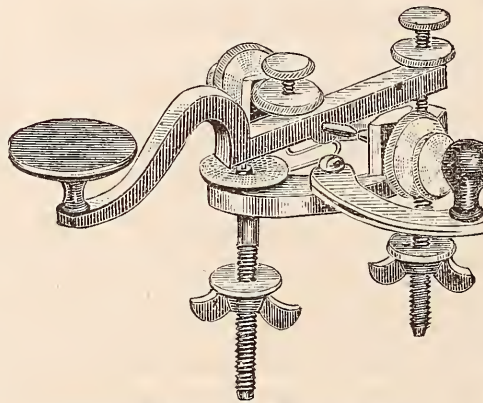
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MANUFACTURERS OF
ELECTRICAL AND TELEGRAPH INSTRUMENTS
AND
Material of Every Description,
RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.
Nickel Plated Goods a Specialty.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



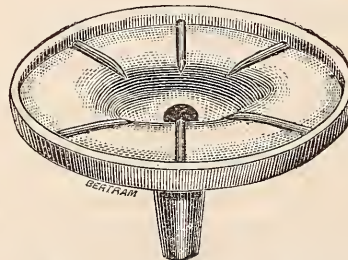
Price, \$5.50 plain; \$7 nickel plated.

The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK, }
Sept. 22d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,
A. S. BROWN, Manager



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

SWITCHES, GALVANOMETERS, RESISTANCE COILS, &c., to order.
Designs for Switch Boards for special service furnished.

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for Hotels and Residences.

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IS SUPPLIED BY
L. G. TILLOTSON & CO.,
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OF
TELEGRAPH MACHINERY, SUPPLIES
AND
Line Equipment of every Description

MATERIAL AND INSTRUMENTS
always on hand, for the equipment of lines of any length, at a moment's notice.

We furnish first class goods at low prices. Liberal arrangements made with Superintendents, Contractors and Builders of Telegraph Lines.

Registers.....	\$38 00 to \$45 00
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Relays.....	14 00 to 18 00
Sounders.....	3 50 to 7 50
Keys.....	4 00 to 6 50
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Galvanometers, \$7 00 upward.	

RATTLE TELEGRAPH SOUNDER, \$3.50.

POCKET INSTRUMENTS, Nickel Plated, in Hard Rubber Cases, 1 1/2 x 2 1/2 inches.

CUT-OUTS, Plug, Peg or Button, with or without Lightning Arresters, for one, two or more Lines.

JONES' PATENT LOCK SWITCHES, the best and cheapest in use, with or without Lightning Arresters.

PEG or PIN, CULGAN, REPEATING, GROUND, LOCAL, BATTERY and SINGLE BUTTON SWITCHES.

LIGHTNING ARRESTERS for any number of wires, of most approved patterns.

ELECTRO-MAGNETS, PERMANENT MAGNETS, APPARATUS for STUDENTS and AMATEUR TELEGRAPHERS, ELECTRIC MOTORS, PRINTING and DIAL INSTRUMENTS,

ELECTRICAL ANNUNCIATORS, FIRE and BURGLAR ALARMS, ELECTRO-MEDICAL INSTRUMENTS.

RHUMKORFF COILS, from 1/4 to 10 inch spark.

GEISSLER'S TUBES, from \$1.00 upwards
ELECTRICAL CALL AND ALARM BELLS in great variety, from \$6.50 upward.

INSTRUMENTS furnished Nickel Plated at 20 per cent. advance on List Price.

OFFICE WIRES, from 80c. to \$1.25 per pound.

GUTTA-PERCHA COVERED WIRES, all sizes.

BISHOP'S NEW COMPOUND COVERED WIRE, for running into offices, 4c. per foot.

MAGNET WIRES, in Silk and Cotton, at Factory prices.

INSULATED WIRES for special purposes made to order.

SILK COVERED SWITCH CORD, one, two or more conductors.
PATENT MESSAGE HOOKS, the best ever introduced, prices 65c. and 75c. per dozen.

MANIFOLD PAPER and AGATE STYLUS at bottom prices.

CABLES AND SUBMARINE WIRES.

REPAIRERS' TOOLS and TOOL BAGS.

GLASS AND RUBBER WINDOW TUBES.

KENOSHA AND OTHER INSULATORS OF EVERY DESCRIPTION.

BRACKETS, PINS AND SPIKES.

HILL, CALLAUD, GROVE, BUNSEN, CARBON, DANIELLS, LECLANCHÉ, NITRO-CHROMIC AND OTHER

STYLES OF BATTERY IN ANY QUANTITIES.

PURE CHEMICALS AT LOWEST PRICES.

SULPHATE OF COPPER A SPECIALTY, AND PRICES VERY LOW.

CARBON PLATES made to order for Grenil, Smee, Stohrer and other Batteries.

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ALL STANDARD WORKS on ELECTRICITY & TELEGRAPHY.
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L. G. TILLOTSON & CO.,

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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, February 21, 1874. Whole No. 397

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109 COURT STREET, BOSTON, MASS.,
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D. W. PUTT & CO.'S Mechanical Telegraph Instruments,
"Pope's Modern Practice of the Electric Telegraph,"
AND A FULL ASSORTMENT OF
TELEGRAPH MATERIALS AND SUPPLIES.
AT THE LOWEST PRICES.

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MANUFACTURERS OF
All kinds of Electrical Instruments
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All orders promptly filled, at reasonable prices.
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WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
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WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
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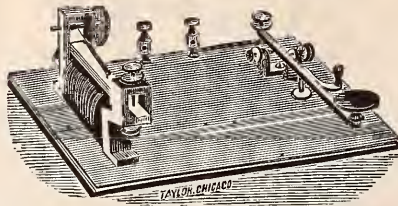
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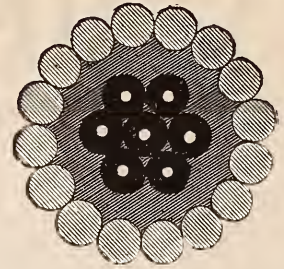
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, FEBRUARY 21, 1874.

VOL. X. WHOLE No. 397.

An Operator's Musings.

By J. A.

The other night, 'twas dark and dreary,
An operator, tired and weary,
Sitting within his office gloomy,
With sullen look on his "visnomy."

The rain beat fast on pane and shutter,
The wind swept round with dreadful clutter;
And he, poor soul, felt quite forlorn,
As o'er the wire these words were borne:

"Poor baby died at half past seven;
Buried to-morrow at eleven;"
He spoke aloud, in tones of sorrow,
"Alive to-day and dead to-morrow."

The mystic words set him a thinking
Of thousands who are daily sinking
Into the grave. Death shoots the arrow—
Alive to-day and dead to-morrow.

Such were his thoughts. A gentle tapping
Aroused him from his solemn napping;
He looked around in silent wonder—
The sound appeared like distant thunder.

"It cannot be; I've not been sleeping,
The clock strikes three; how time is fleeting;
But hark! there goes another message,
On wings as swift as birds of passage:"

"A child was born this morning early,
And such a boy is seen but rarely;"
This was the substance of the letter
Or telegram—the name is better.

Yet so it is, while time doth linger,
Or cruel Death doth point its finger;
Or souls come forth to worldly sorrow,
Some born to-day and die to-morrow.

Ah, what! still, still there goes another,
The deepest grief and gloom to smother;
"Married this morning—Sister Pearly
Arrive by train to-morrow early."

Two loving hearts have been united,
Their futures bright, their paths unblighted
By dire misfortune—Death will sever,
They live to-day, but not forever.

Yet such is life, its joys, its troubles;
Still it is naught but glistening bubbles;
For time will pierce the heart with sorrow
Wedded to-day, and die to-morrow.

Original Articles.

The Elementary Principles of Electrical Measurement.

By F. L. POPE.

(Continued from page 25.)

The Galvanometer.

A MAGNETIC needle, freely suspended in such a manner as to be at liberty to place itself in the magnetic meridian, and provided with a conducting wire so arranged as to convey an electric current parallel to and in the immediate vicinity of itself, constitutes a *galvanometer*. A scale divided into degrees is usually added, by means of which the angle through which the needle is deflected from the magnetic meridian may be conveniently ascertained. As the galvanometer in some form is almost an indispensable requisite in every class of electrical measurements, it is desirable to become acquainted with its different modifications before taking up the subject of electrical measurements in detail.

Galvanometers may be conveniently divided into two classes. In instruments of the first class the angles of the deflections are not proportional to the strength of current by which they are produced, except to a limited extent, while in those of the second class the deflections bear a fixed and definite mathematical relation to the strength or quantity of the currents by which they are produced, throughout the whole extent of the scale.

The simplest form of the galvanometer consists of a carefully balanced magnetic needle, capable of turning freely in a horizontal plane, and a conductor consisting of a metallic wire or band passing close to the needle, either above or beneath it, in a direction parallel to the magnetic meridian. This arrangement is illustrated in Fig. 6. NS is the magnetic needle, and RW a wire passing directly over and parallel to it. The direction of this wire must necessarily be north and south, as the needle will always assume that position

under the influence of the earth's magnetism. If now the extremities of the wire RW are connected with the poles of a voltaic battery, so as to cause an electric current to pass through it, the needle NS will be deflected from its normal position, and will assume the position *a b* or *c d*, according to the direction of the current passing through the wire RW. If the wire be placed

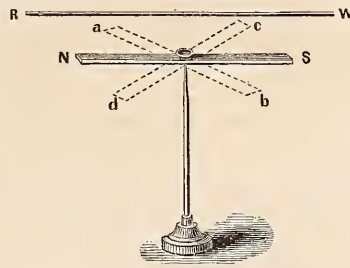


Fig. 6.

in the same direction, but below the needle the deflections will be the reverse of those produced by the same current when passing above the needle. For example, if the copper or positive pole of the battery is attached to W, and the zinc or negative pole to R, the north seeking pole of the needle will turn to the west if the latter is below the wire, and to the east if above it.

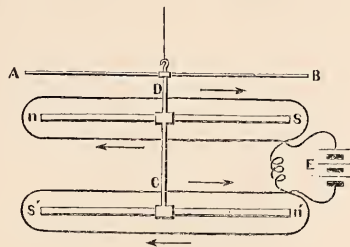


Fig. 7.

The tendency of the force exercised upon the needle by the current is to place it in a position at right angles to the conducting wire, and consequently to the magnetic meridian. But it is not possible for even the most powerful current to deflect a needle sufficiently to cause it to assume a position exactly at right angles

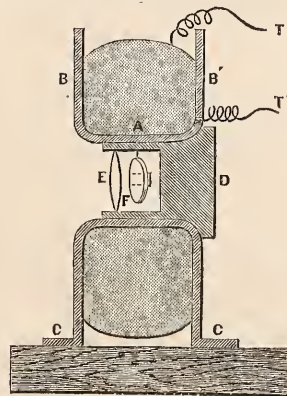


Fig. 8.

to the conductor, because of the influence of the earth's magnetism, which still acts upon the needle and tends to draw it back to its original position.

If the conductor be carried entirely around the needle, so as to pass once above and once beneath it,

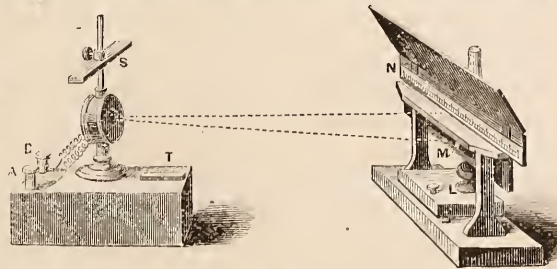


Fig. 9.

the influence of the current upon the needle will be doubled, and the resulting deflection considerably increased. It will be evident, upon reflection, that as the current passes in one direction above the needle, and in the other direction below it, the tendency of both will be to deflect the needle in the same direction. This

operation of carrying the wire around the needle may be repeated any required number of times, and in this manner the effect of a very feeble current upon a needle may be multiplied until it manifests itself by causing a deflection. Hence, a needle surrounded by a number of turns or convolutions of wire is called a *multiplier*. The writer has employed in some of his experiments an instrument of this kind, having 40,000 convolutions of fine wire surrounding the needle.

The most sensitive galvanometers or multipliers are those provided with what is termed an *astatic* system of needles. This consists of two separate needles, coupled together in the manner shown in Fig. 7. Both needles are placed in the same perpendicular planes, one directly over the other, but with their north and south poles opposite to each other. If the magnetism of the two needles were exactly equal, and they were also exactly parallel to each other, the action of the earth's magnetism upon each of them would be equal and opposite, and consequently they would remain at rest in any position indifferently. But in practice one needle always slightly overpowers the other, and by this excess determines the position of equilibrium. This position is never in the magnetic meridian, and is often nearly at right angles to it.

In the astatic system, represented in Fig. 7, the directive force of the earth's magnetism is nearly neutralized by the influence of the two needles upon each other, while on the other hand the magnetic effect of the current upon the system is doubled. This is accomplished by arranging the conducting wire in such a manner that it will tend to deflect both needles in the same direction, as will readily be understood by a careful inspection of the figure. A light pointer or index, AB, is placed upon the axis above the upper coil, which traverses a scale divided into degrees, and serves to indicate the angle of deflection of the needles.

In some instruments the lower needle only is surrounded by the conducting wire, and in this case the upper needle may serve as a pointer. Of course, this combination is less sensitive to the action of feeble currents than the preceding one.

A system of astatic needles is usually suspended by a minute filament of silk, and is therefore capable of being deflected by an exceedingly feeble current.

A galvanometer or multiplier, constructed upon the plan which has just been described, is principally useful as a means of detecting the presence of an electric current. As a measure of the actual magnitude of a current it is deficient, inasmuch as its deflections are not proportional to the currents by which they are produced beyond 14° or 15° of the scale. The reason of this will be apparent hereafter.

Thomson's Reflecting Galvanometer.

This beautiful apparatus, invented by Sir William Thomson of Glasgow University, is the most sensitive and probably the most generally useful instrument of the kind ever devised. Strictly speaking it is one of the class above referred to, the deflections of which are not, beyond a certain point, proportional to the currents producing them. It is, however, so arranged that in practice the actual deflections of the needle which are observed, are never required to exceed a very few degrees on each side of the meridian, and, therefore, the values indicated by them are in reality strictly proportional to the currents by which they are produced.

The principle of the reflecting galvanometer is well shown in Fig. 8, which is taken from Jenkin's *Electricity and Magnetism*.

A copper wire, insulated by being overspun with silk, is wound upon a hollow cylindrical bobbin of brass, A, provided with deep flanges, B B', and having feet at C by which it is supported upon a base of wood or hard rubber. Inside of A a small brass plug, D, is fitted, having at one end a hollow chamber about 0.6 inches in diameter, which is closed by the lens E. The latter should have a focal distance of about 48 inches. Within the little chamber the mirror and magnet are suspended by a single fibre of silk—such as may be drawn out of a silk ribbon—and which should be so thin as to be almost invisible. The mirror itself is formed of microscope glass as truly plane in surface and as thin as possible. The length of the magnet is equal to the diameter of the mirror—about half an inch—and is attached to the latter by means of a little shellac dissolved in alcohol. The magnet is often made of a piece of watch spring. Care should be taken that the mirror is not drawn out of shape when the magnet is attached to it. The silk fibre is also secured to the mirror by means of the shellac varnish, and then threaded through a small hole in the top of the chamber, by means of a needle with a little varnish on it, and secured by means of the same material.

When thus arranged, the plug D and its contents may be introduced into or withdrawn from A at pleasure. The outside diameter of the flanges B B' is about 2.5 inches, and of the length from B to B' about 1.7 inches.

The diameter of the wire with which the space inside the flanges B B' is wound, depends upon the purpose for which the instrument is to be used, as will

be hereafter explained. The two ends of the galvanometer wire T and T' are connected to two binding-screws, a and b, Fig. 9, insulated by means of hard rubber, and to which other wires may be attached. The instrument is completed by a common kerosene lamp, L, placed behind a screen having a slit M in it, in front of the mirror, and being also provided with a horizontal white paper scale N, about twenty inches in length. When the apparatus is arranged as shown in Fig. 9, a narrow pencil of light from the lamp L passes through the opening M, and thence through the lens to the little mirror, and is reflected back by the latter through the lens, which forms a sharp image of the flame of the lamp upon the scale. The zero point is in the centre of the scale, exactly opposite the mirror, and when no current is passing the spot of light which serves as an index remains at zero.

The operator reads the indications from a point just in the rear of the magnet and coil, the light of the lamp being cut off by the screen, so that he only sees the small luminous opening through which the light passes to the mirror, and a brilliantly defined image of the flame upon the white scale just above, which is kept in shadow by the screen. If by the passage of a current through the coil the magnet is deflected to the right or left, the spot of light moves to the right or left along the scale. The angle formed by the reflected rays being twice the angle through which the magnet and mirror are deflected, a very small angle causes a comparatively great displacement of the image. It will at once be seen that we virtually have in this instrument an index arm four or five feet long, absolutely without either weight or inertia.

With an instrument of the above proportions the indicated deflections are, as has been explained, almost strictly in proportion to the strength of current producing them, the range of the magnet itself being considerably less than 14° on each side of zero. It is a good plan to have the scale curved to form part of a circle having its centre at the point of suspension of the magnet.

An adjustable permanent magnet, S, is usually placed in the magnetic meridian above the coil; by raising or lowering this magnet the action of the directive force of the earth upon the suspended magnet may be increased or weakened at pleasure. If the south pole of S is placed to the south it may be put in such a position as to render the needle nearly astatic. The instrument is then in its most sensitive position, but the spot of light will never remain quite stationary. The zero adjustment may then be controlled by a second small magnet, T, placed at right angles to the magnetic meridian.

A galvanometer of this kind might be constructed by an ingenious student without much difficulty, and would be a very useful and instructive instrument.

(To be continued.)

[From *The Ghost.*]

Death!

It is with sincere sorrow that we announce the death, on the 11th inst., of the eldest son of Mr. J. T. Olmstead, of this office. There are others among us who have stood over the agonized form of our first born and best beloved of all, and seen the little face on which we have looked so proudly lose the tinge of life, the little limbs grow cold, and felt, alas! how sure is death. All who have met this sad experience will sympathize to-day with our fellow laborer in his bereavement heartily and sincerely. No one else can sympathize completely. Such losses as these cast a shadow into a man's heart, that good fortune, good health, a swarm of smiling children—everything the world may give—can never quite light up. It is a grief which, coming but once, outweighs all other sorrows, and leaves a scar which none can comprehend but those who number it among their woes.

Gilbert M. Simmons, formerly a printing operator in this office, died on the 12th inst., at his home in Williamsburgh. His death resulted from a paralytic shock sustained in May last, hastened somewhat, perhaps, by a dropsical tendency. Mr. Simmons belonged in Poughkeepsie, N. Y., but had worked here for ten years or more, and was quite well known among printing operators generally. He recovered partially from his paralysis during the fall, and resumed his place for a few weeks, but when cold weather came on he again withdrew and he never returned. His death, while it was not unlooked for by those who knew of his critical condition, will take many by surprise, as it seems but yesterday that he was here. He and Charles F. Simmons, who died in San Francisco on the 22d of last December, were brothers.

At Springfield, Mass., on the 11th inst., F. E. Curtis, better known among the profession as "the Major," died suddenly at his home, where he had been confined several days with a slight indisposition. He was thought to be recovering, but in the early part of the day he was seized with apoplexy and died almost instantly. "Major" Curtis was in his twenty-ninth

year, and had been identified with No. 4 East for ten years or more. He was a dwarf in stature, but mentally he stood among the most intelligent members of the profession. Naturally of a smart, quick temperament, he was sufficiently educated and travelled to be a most genial companion, and on postprandial occasions he was ever happy, comical and interesting in his remarks. He had his peculiarities, like the rest of us, but his *bonhomie* served as an ample mantle to hide his faults, and his friends were those who knew him long and intimately.

[From *The Ghost.*]

Odds and Ends.

On St. Valentine's day there passed through this office the following poet's appeal, supposed from its tenor to be going from a father to his absent dear:

An empty chair is by my side;
An empty void is gaping wide,
No call for pickles greets my ear;
No cry for augur do I hear.

The girl who at my right hand sat
Has donned her jacket and her hat,
And off to Bristol she has gone,
And left her Popsey all alone.

Oh, do come back, and once more shine,
And be your dove's valentine!

Here is a short one of a similar shade, which comes to us on what compositors would call "snake copy," and is, presumedly, the work of one of the printing operators:

Well, Jake and George, my honest blades, I'm sorry for to say
My heart is sad, my mem'ry fades; forgot 'twas Cupid's day.
So, not to let the custom fall, I'll simply drop a line;
I'm yours—body, boots and all—your mouldy valentine.

A young man, who lamented in these columns his disgust at having to work on New Year's day, and optically resolved that

"During seventy-four, you bet,
I'll steadily keep out of debt," etc.,

has split upon another rock thus early in the year, and tells his story after this fashion:

I love her yet, that sweet brunette,
Although she has deceived me.
Her cruel ways did nearly craze,
And have quite sorely grieved me.

She wrote bad Morse, but yet, of course,
I never dared to break her.
She was so proud, she'd tell the crowd
How fast and well I'd take her.

But oh! alas! it came to pass
I made a horrid blunder,
Which raised her ire, and o'er the wire
Said she, "You go to thunder!"

PERSONAL AND GENERAL.

John F. Riley, of Hartford, whose numerous messages—"Get me a 'sub' to night," "You know how I am," "I am on my way up town"—made him famous while here, is sojourning in New York for awhile, and he looks as if the world was using him pretty well, too.

The *Baltimore American* announces that the proprietors of that journal have purchased the building corner of Baltimore and South streets, Baltimore, now occupied by the Western Union Telegraph Company, on the site of which they intend to erect a \$125,000 shanty, known as the *Baltimore American* Building.

Mr. A. D. Taylor, a day operator heretofore, succeeds F. E. Curtis, deceased, as night report operator at Springfield, Mass. Mr. Taylor is one of the finest operators of our acquaintance, and those who manipulate No. 4 East at this end will be glad to learn of his permanent appointment.

On the 4th instant Mr. William H. Hargrave, of this office, was united in wedlock, at White Plains, N. Y., to Miss Ella L. Esler—the Rev. Mr. Van Kleeck officiating. It seems an empty thing to say "we congratulate," etc.; but, perhaps, the unusual sincerity with which we wish this newly married pair a happy voyage over life's dangerous waters, may render our congratulations acceptable.

Dr. Fowler Bradnac has returned to New York and will commence the practice of medicine here. He comes from Detroit, where he has relinquished a large and lucrative business—the social attractions of this metropolis and the facilities afforded for a professional man to perfect himself in his studies, having done the business for this genial disciple of Esculapius, as it has for the disciples of Bacchus, Momus and numerous other old parties who did some time back. The doctor will, perhaps, combine physic with electrical science, and agitate the brass occasionally.

The Switch is the title of a diminutive journal published in the Western Union Chicago office. It is edited by the well known "Billy" Wallace, and is replete with local hits and happenings. It must be keenly relished by the Chicagoans, to whom every line tells a tale—the fine point involved in which is not so readily seen by outsiders. However, there are lots of things in *The Switch* which are enjoyable to all, though we

lay it down rather sorry that we have not a better acquaintance with our Chicago brethren, so we might know more accurately on whom *The Switch* is laid, and whose foibles are so pleasantly lashed in its columns.

We again beg to acknowledge our indebtedness to Mr. J. J. Calahan for his efforts to the end of making *The Ghost* lively and entertaining. His caricatures, always funny without being personal, are laughed over by everybody and admired by all. "The twenty-seventh man off," as he appeared at the South Ferry," and the thirsty trio of telegraphic "bums," who, having accidentally met in New York, penniless, of course, are "snuffing the bottle from afar off," are worthy of a place in any humorous journal in existence; but, unfortunately, the subjects are not to be appreciated by those of the common clay, and so Mr. Calahan, like many another genius before him, continues to hide his light under a bushel.

Dr. J. C. Graham, of No. 145, has been made the recipient of a very handsome Russia leather cigar case, the donors being Messrs. O'Brien and Clarke, night operators at Scranton and Wilkesbarre, respectively. The gift is tendered, as a note which accompanies it explains, in token of their appreciation of his patience and judgment in sending "State Press." Courtesies of this kind are so very rare—the receiving operators on a press wire having an affection for the sender very similar to that which his satanic majesty is supposed to entertain for holy water—that this one should go on record by all means. The "regular practitioner," we believe, will not advertise, but we hope Dr. Graham will not "kick" at this publicity. In the words of inky Othello:

"It is the cause—it is the cause, my soul."

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Closing Services of the P. and A. Chicago Office.—Location of the late Employees.

NORTHWEST, February 7.

TO THE EDITOR OF THE TELEGRAPHER.

As the Pacific and Atlantic Company is permanently defunct, and the employes scattered here and there, it is desired by those of us in this section of the country to learn through the columns of THE TELEGRAPHER what has become of them, and how they have fared since the last "Good night" was said on the P. and A. wires, and they passed to and became a part of the Western Union system?

That memorable Saturday evening, December 27, 1873, is one long to be remembered by the officers and employes of the Chicago offices.

Among the greetings exchanged, the following to Circuit Manager Long will show what kindly feelings existed between the operators as a class:

"PITTSBURG, PA., Dec. 27, 1873.

"To W. C. LONG, Chicago, Ill.

"In behalf of the operators in this office, allow me to thank you for your courtesy toward us. May you live long and prosper is the wish of each one of us. Present our compliments to your force. Our wires are being cut and switched into Western Union now. Farewell. (Signed), RA."

As "Ra" was the operator who generally worked Chicago circuit the above gave us all the more pleasure, because it came from one who knew all our failings as well as our good points.

A little before six o'clock Supt. Wilson, of the Western Union, entered the office, and, with Circuit Manager Long at the switch board, disconnected the wires. As fast as opened by the closing of a key in the Western Union office the transfer was made, so complete were the arrangements in W. U. for the transfer.

Messrs. Pearson and Stevely accepted positions in the operators' ranks in the W. U. office. Messrs. Long, Fortier, and Hall were put on the W. U. day force, and Mr. Dennis on the night force. Mr. Gross accepted a position as operator and clerk with the A. and P. Co., Chicago, Ill. Garner has accepted a position with the Chicago and Northwestern Railway Co. as operator and signal man at Tunnel No. 3, Summit, Wis.

Messrs. Harris and Iredale, "Branch Office men," continue in their respective offices, which are maintained as Western Union offices. The "Indomitable Louderback," who established an office on commission with the three opposition lines, P. and A., A. and P. and Great Western, at No. 86 Madison street, continues there for the Western Union Company. The balance of the branch offices were closed.

Communications from others as to whereabouts and positions of the Israelites will be acceptable and highly appreciated.

A word in regard to subscriptions. I am sorry to see so much indifference manifested towards THE TELEGRAPHER, and hope operators will wake up to their interests by rolling in a liberal subscription from all quarters. I must say that my success in soliciting subscribers has been the same sad experience as that of my fellow laborer over the signature of "T," in issue of January 24th. Ex. P. AND A.

A Matrimonial Failing.

ALBANY, OREGON, Jan. 30th.

TO THE EDITOR OF THE TELEGRAPHER.

FAILING to keep THE TELEGRAPHER posted as to what is going on is something I very seldom do. Everybody, of course, have their failings, but we of the Oregon and California Railroad Telegraph have one we think a good deal of—i. e., Chas. D. Faling, Superintendent of Telegraph and Train Despatcher, but we must say we were very much surprised last Wednesday to learn that, failing to find true enjoyment in the life of a bachelor, he had taken unto himself a wife. Yesterday the following telegram of congratulation was prepared and sent over the wire to Mr. Faling by Assistant Chief Operator Rice, of Albany office. After Mr. Rice had finished sending it Mr. Kenny, Chief Operator, signed it, then each operator in routine all over the wire. The following is the message:

"CHAS. D. FALING,

Superintendent Telegraph O. and C. Railroad.

We tender to you, Mr. Faling, our sincere congratulations upon the annexation of an accomplished and excellent partner to your markedly failing firm. Our failure to more promptly learn of the failing alliance is our apology for failing sooner to proffer our open expression of that never failing good will which unfailingly possesses our several breasts. May the circuit of your perfect happiness long remain unbroken, being clear of escapes and free from resistance. May your relays never fail you, a proper adjustment being unfailingly maintained. May you, never failing in the full enjoyment of life's pleasures, as you go dotting and dashing along her lightning pathway, find no grounds of discord to mar your harmonious working; and should crosses annoy, may they ever be sympathetic. May Time, as he rapidly clicks the hours away, ever adding something new, also add many lesser failings to your already failing household; and when the final good night is given, may your *i* be the signal for that triumphant promotion which is the merit of an unfailingly faithful discharge of life's every duty. Such are the wishes of your employes. (Signed),

- | | |
|--------------------------|-----------------------------|
| JNO. J. KENNY, Chf. Opr. | W. B. RICE, Asst. Chf. Opr. |
| W. W. SKINNER. | G. A. TAYLOR. |
| J. E. TIBBETTS. | O. A. TIBBETTS. |
| C. E. PARKS. | W. A. WILLIAMS. |
| J. H. REID. | C. R. WHEELER. |
| GEO. F. CROW. | J. M. FISH. |
| J. H. WOODROW. | J. L. WILLIAMS. |
| S. B. HENDEE. | H. C. STEVENS. |

W. T. BRADLEY."

Mr. Faling was nonplussed for awhile, but shortly recovering from his surprise, telegraphed the following reply:

"Operators O. and C. Railroad.

GENTLEMEN: Allow me to return you my sincere thanks for your kind wishes and hearty congratulations. I assure you they are deeply and truly appreciated. Hoping that the bonds of friendship which have existed between us may never be severed, and that fraternally our harmonious relations may continue as heretofore, I remain very truly yours,

CHAS. D. FALING."

As lottery gent remarks—"Who's the next lucky man?" This looks discouraging to us five (5) poor lonely old fellows—all that are left out of a band of fifteen gay bachelors a year or so ago. But we will try and bear the burden yet a little longer, and there will, we trust, be further rejoicing in ——— WEBFOOT.

Good Counsel to the Telegraphic Fraternity.

TO THE EDITOR OF THE TELEGRAPHER.

FOR some time I have desired to respond to the communications and remarks of "Nettie Bronson," and to let her know that I sympathize with and feel for her. It occurred to me to try to obtain her real name and address, and open a personal correspondence with her, to tell her my experience, and how I fought my way until I obtained the position and office that I finally secured here; but, on further consideration, I was doubtful whether she would appreciate it, or be willing to correspond with an operator of her own sex, and so abandoned the idea.

In THE TELEGRAPHER of February 7th I noticed communications over the signatures of "Elias" and "S. L. C.," which have again brought the subject to my mind, and I have decided to respond, if room can be accorded for my communication in your columns. "Elias" has expressed my opinion in regard to "Nettie

Bronson" exactly. I should like to hear from her occasionally through THE TELEGRAPHER, and learn how she prospers in what I know by experience to be an arduous undertaking for a woman—getting a living by telegraphy.

I am thankful that opportunity is given in your columns for a discussion of the morals and conduct of the fraternity, which has changed my views concerning them somewhat, as set forth in my communication of Aug. 9th, 1873, over the signature of "Female Operator," when I made public my grievances.

I am sorry to say that since then, as far as my acquaintance has gone with them on this circuit, I have met but three or four (certainly not more) who may properly be called gentlemen in every respect—never meeting these in person and not knowing their bad habits, if they have any, but judge that they have none. I have found, however, that as a general thing those who were coarse and ungentlemanly over the line were drinkers, smokers, billiard players, etc.—slaves to habits which sink men below the brutes. Thank God that they are not all alike! and may he bless those who can say No to every temptation. Their reward is and will be great.

Brothers, continue in well doing. I would request you to remember this fraternity in your daily devotions, as I have done ever since I became connected with telegraphy. We who can and do resist temptation should let our light so shine that others may see that we are walking with Christ.

To the young, careless and reckless, I would say, "It is not all of life to live here." No, we are only pilgrims and strangers here, journeying, it is to be hoped, towards a better land. Let us so live that we may all meet there. Good bye all. God bless you and keep you, and give you strength to overcome all evil. JENNIE.

A Heavy Sleet Storm.—A Telegraph Line Man Freed by a Mule.

CHARLESTON, S. C., Feb. 11.

TO THE EDITOR OF THE TELEGRAPHER.

SEEING nothing in your columns from our section, I have concluded to let the world know that we still live, though one of the heaviest sleet storms that has ever visited this country stopped all direct communication with the north for five days. The breaks between Charlotte, N. C., and Danville, Va., were about forty to the mile, and it will take several weeks to restore wires to their original condition. We got Washington Sunday on temporary wires and work well to New York now. During the break the Western Union kept their northern business moving via Nashville, with, of course, some delay, but the Southern and Atlantic having no other outlet, had to refuse everything and grin and bear it patiently, waiting anxiously for a clik from Washington. The weather here during the storm was cold and wet, and so very disagreeable that half the usual number of drinks were sufficient to retain the high polish and beautiful coloring on the tips of the natives' noses.

Charleston has a natural curiosity in the person of a nobby huanan, who hails from Virginia, and is the happy possessor of 1,500 acres of highly cultivated land in that State. He is one of those lucky chaps always finding knives and money in the street cars. When he sees a quarter on the floor he don't put his foot on it and await an opportunity of sliding it in his pocket, like the rest of us, but picks it up and offers it to every passenger in the car, and if no one claims it tries to force it into the conductor's or driver's hands. He is always purchasing canaries and mocking birds for his friends; but, unluckily, is kept so busy that the birds take wing and fly away just before he has time to go for them. Every time he goes out in the country repairing he purchases chickens, eggs, etc., in abundance for the married men in the office, but it always happens that there is company at the seller's house just before he calls for them, and chicks, eggs and everything have been cooked for said company, but he can have more next week.

He is now feeling very blue because an amateur minstrel troupe organizing here won't allow him to buy instruments for them, and start them out in true Virginia style, with diamond rings, pins, swallow tailed brass button coats, paper bosoms, etc. He offered to do it, and thinks hard of them for refusing the offer.

He was out repairing during the late cold snap, and was up a rather decayed pole putting on an insulator. Whilst busy at work a man rode up, dismounted, and hitched his mule, a very vicious one, to this pole. Jim's fingers getting benumbed he starts down to warm them; but imagine his dismay when he beheld the mule with his fore feet up the pole, trying to reach him with his teeth. There is no doubt of his bravery, as three years' honorable service in the army will testify, but here was a dilemma. If he remained up the pole he would freeze on it. If he descended the mule would freeze on him, or even if he could scare him off he might pull the pole down in his endeavors to get away,

in which event he was liable to be severely injured by the fall. He concluded to risk the freeze rather than the teeth, so mounted higher and got astride a cross arm, where he sat whistling "Thou art so near and yet so far," and singing psalms till the shades of night brought the owner of the mule back, who unhitched him and rode off into the darkness, releasing the half frozen telegrapher from his airy perch.

I hear that one of the boys passing along saw him when he first discovered the mule and had him photographed. If so I will send you a copy.

He is now throwing money around among the politicians endeavoring to have an ordinance passed prohibiting hitching rabid mules to telegraph poles.

We all look forward impatiently for your paper day, and it is a most welcome sheet. Why it is not subscribed for by every one in the business is beyond my comprehension, containing as it does so much valuable information, besides being the well known champion of the fraternity. QUILP.

Justice to Military Telegraph Operators.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE in THE TELEGRAPHER of February 7 a communication signed "Agitator," in regard to a land bounty for telegraph operators who served the Government during the war of the rebellion. As one of the many operators interested in this question, I should very much like to know what, if anything, has at any time been done to bring our claims before Congress. Certainly it cannot be denied that our services were quite as valuable to the Government as were those of the brave soldier boys who so gallantly ran the risk of becoming "food for powder," and are now enjoying their country's bounty. Although we did not bear arms, we were constantly exposed to danger and sickness; and many of our number standing faithfully at their posts at points inadequately guarded, were captured by the enemy and suffered all the horrors of their prison pens; others languished on cots (not beds) of sickness, and many laid down their lives as nobly as did their brethren on the battle field. By our aid many calamities were averted, and many advantages gained which could not have been gained without the help of our little "clickers," insignificant as they might seem among the mighty "engines of war" by which they were surrounded. And wherever our army corps were found there also were seen our field lines, and our brave boys of the "key and quill," doing as effectual service as they of the "sword and epaulette;" while in the rear, along the railway lines of communication and supply, their brethren stood sentinel night and day, watching with untiring fidelity the progress and safety of the trains bearing to the front the necessaries of life for those in the field. None were more trusted, or more implicitly relied upon by the President and the generals in command, and none more fully proved themselves worthy of such confidence. Why, then, should Congress be unwilling to recognize our services by according to us a land bounty? Few of us are so "well to do" in this world's gear that such a bounty would not seem, and in reality be, a godsend. It seems to me that it only requires concerted action on our part to set the ball in motion and carry our cause to a successful issue. Surely we shall find advocates among those in power who are cognizant of the justice of our claims. Compared with the hosts of arms bearers our numbers are small, even insignificant; but our services cannot be estimated on a basis of "one man power." As your correspondent, "Agitator," truly says, "The services of one operator were often of greater value than those of whole regiments."

I am not an organizer, and feel incompetent to suggest a course to be pursued in this matter; but I hope others who are interested, and would be benefited by an Act of Congress in favor of Military Telegraph Operators, will give us their views through your columns. "Agitator's" suggestion that a petition be circulated, may be a solution of the question as to how we shall get our claim before Congress. Let the matter not be dropped again until some end is arrived at, either favorable or otherwise. We believe our claim to be just. Let us prosecute it with determination, and why shall we not succeed? ONE OF THE BOYS.

A Correction.

TO THE EDITOR OF THE TELEGRAPHER.

In my article last week, on the "Bridge Duplex," I attempted to say, "It is not practicable to increase the sensitiveness of the receiving relay by substituting one of higher resistance." The printer made it read lighter resistance, which inverted the sense of the passage. As usual. F. L. POPE.

Answer to Correspondent.

TRIP.—The message received properly contains eight words only, but what the latest Western Union official ruling may be we don't know.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

SATURDAY, FEBRUARY 21, 1874.

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THE TELEGRAPHER.

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DEVOTED TO THE INTERESTS OF THE

Telegraphic Fraternity and the Advancement of Electrical Science and the Telegraphic Art.

Published Every Saturday,

AT

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Justice to Military Telegraph Employees.

We print this week a communication from another telegrapher, who, during the war, was employed in the military service of the United States, in regard to an appropriation by Congress of a land bounty to such as served faithfully in that capacity.

An act was introduced in the last Congress by Mr. RICHIE, who was a member of the House from Maryland, and the subject was considerably discussed in THE TELEGRAPHER at the time, but finally the Congress expired and nothing was done with it. Our correspondent "Agitator," in a recent number of this paper again called attention to the matter, and it is beginning to attract the notice of the parties interested.

We are aware that the present is not a very favorable time to present claims for bounty or recognition of past services to Congress, but in this case the justice of the claim is so clear and indisputable that it seems to us a proper presentation of it would secure attention even now.

In commenting on this matter in THE TELEGRAPHER of May 11, 1872, we said "If any persons who were in the United States military service during the war are entitled to recognition, and a grant of land from Congress, those who were in the telegraph service of the army should not be neglected or overlooked. Many of the telegraphers who were engaged in the military telegraph service were exposed to greater hardships and dangers than their associates in other departments, and performed services of incalculable value and importance. The safety of armies and the success of most important military operations frequently depended upon the courage and fidelity of the military telegraphers, and they were never found wanting in zeal or devotion to the national interests." We do not know that we can add anything to this presentation of the case. The statements made are indisputable and never have been disputed, to our knowledge. We have heard of no special opposition to Mr. RICHIE'S act having been made, but our recollection of the matter is that it failed for want of time, or from not having been urged with sufficient energy by those who were interested.

We have no doubt but that a proper presentation of the claims of the military telegraphers would secure recognition, and ultimately justice being done to them. To effect this, however, there must be an organized effort made; if possible some influential member should be induced to take the matter up and present it properly to Congress, and his efforts should be supplemented by the petitions and personal exertions of as many of the parties interested as can be reached at this time.

Congress will remain in session at least until the latter part of next June, and perhaps longer, and if a move is made within the next month or six weeks it is possible that something may be accomplished even at the present session. To do this, however, will require immediate personal effort on the part of those who are concerned.

Believing the claims of the military telegraphers to be just and equitable, THE TELEGRAPHER will hereafter, as heretofore, support them to the extent of its ability and influence, but without such effort as we have indicated all that we may say or that our correspondents may say on the subject will have but little effect.

The Work of the Patent Office for 1873.—Proposed Reforms in its Organization.

THE Annual Report of the Commissioner of Patents for the year 1873 has just been published, and is in many respects a document of great interest, especially to inventors. The gross receipts of the Patent Office from all sources during the year was \$703,199.77, and the expenditures \$691,178.98. The total number of patents issued was 12,864. The greatest number of patents (2,826) was granted to citizens of New York State, and the least number to Idaho and New Mexico, each 1. Of course we are not surprised to find the inventive faculty proportionately more active in Connecticut than elsewhere, being in the ratio of 1 patent to

every 864 inhabitants. New Mexico is at the other extreme, the ratio there being 1 to every 91,874 inhabitants. The total number of patents issued has varied but little one way or the other from 13,000 per year for the last seven years. The proportion of electrical patents to the whole number during 1873 is a little under 1 per cent.

Commissioner Leggett recommends a number of amendments to the patent law of 1870, which experience has shown to be seriously defective in many particulars, as many inventors have good reason to know. One of the most important of the suggested amendments is one making the duration of an American patent entirely independent of the duration of any foreign patent to the same person. Another is the repeal of an absurd provision in the law of 1870, by which the assignee of the entire interest in a patent, in order to secure a re-issue, must first secure the signature and oath of the inventor, if he be living. The only purpose served by this provision is to place a means of extortion in the hands of unprincipled assignors.

For the third time Commissioner Leggett called the attention of Congress to the necessity of a reorganization of the Patent Office. There is no doubt whatever of the substantial truth of the Commissioner's statement that fully nine-tenths of all the capital invested in manufacturing in this country is thus invested because of the security afforded to it by patents. Hence the importance of ascertaining correctly what is new and useful in each application, and then limiting the applicant's claims to precisely that of which he is really the first inventor. While we consider that the Patent Office, on the whole, has succeeded admirably in doing its work in a creditable and satisfactory manner, in spite of its defective organization, yet it is no less true, as the Commissioner himself says, "that very many applications are hastily and carelessly examined; very many patents are issued every year for subject matter not patentable; and applications are rejected upon which patents should be granted." We also emphatically agree with him when he says: "It is well known that complaints from many sections of the country against our whole patent system arise almost exclusively from patents that have been improperly granted, because of the want of proper supervision in their examination"—a supervision which it is utterly impossible to secure under the system now in vogue in the office.

The plan recommended by the Commissioner is that of grouping the 145 classes in the office into nine divisions, each division to be presided over by a competent official, to review the work of his subordinates. "Such an organization," he says, "would relieve the country of a large number of very annoying patents, which should never be granted, and will secure to real inventors the products of their brain work with much greater certainty than is now done."

It is proposed to meet the somewhat greater expense of the new system by a tax of perhaps twenty dollars, to be paid in by the holders of all patents, at the expiration of six or even seven years from their date. This would probably sweep away a great proportion of the worthless and disused patents, amounting to perhaps 25 per cent. of the whole. The Commissioner says that "this tax would not be onerous upon the holders of patents possessing in themselves any real merit, and would be beneficial in exterminating such as are without merit and stand in the way of substantial and practical improvement."

We heartily endorse every one of the above recommendations, as well as the concluding one, which is in many respects the most important of all, that of establishing at Washington "a Court exclusively for the trial of patent cases, to be composed of men eminent for their legal and judicial talents, and also distinguished for their expert knowledge of the subjects presented in the trial of causes growing out of patents. This Court should be easy of access, always in session, and the pleadings simple and direct. Its findings of fact should be final; its rulings on law

"points might be reviewed, upon proper application 'by the United States Supreme Court.' The great value to inventors and manufacturers of such a Court is so obvious as to need no argument. It would greatly enhance the actual money value of all meritorious patents, and inventors would receive much greater encouragement, also, and remuneration than under the present extremely defective system.

We hope Congress may be induced at length to pay some attention to the very common sense recommendations of the Commissioner. The reforms urged by him are imperatively necessary, and, if carried out, would be worth millions of dollars to the manufacturing and commercial interests of the country. But as the interests of the country are apparently the very last matters that this body of worthies are at all likely to attend to, the prospect of an immediate reform is not particularly encouraging. Still, it may be some satisfaction to Gen. LEGGETT to know that his efforts are appreciated by the large and worthy class whose interests he so ably advocates, and we hope he may continue to hammer away at the honorable members till he accomplishes the desired result.

The Page Patent Litigation.

WE have repeatedly referred to the litigation which is in progress for the purpose of judicially determining the validity or otherwise of the notorious Page patent which practically covers nearly every method of telegraphy, except the Automatic, now used. The defendants in the suits which have been brought by the Western Union Telegraph Company against the Manhattan Quotation Company and Mr. CHARLES T. CHESTER, to enforce this patent, have just filed their reply to the complainants, in which the priority of invention claimed by Prof. PAGE is very thoroughly examined, and shown to be untenable.

We know of nothing which is of more importance to the telegraph interests of the country than the attempt which is being made to reestablish a telegraph monopoly under this patent, and all parties should, without delay, unite with the contestants in defeating this attempt. The contest will, no doubt, be long and expensive, and as an adverse decision will be of general and great value, it is but just that those who are to be benefited should contribute to secure it.

The Dominion Telegraph Company.

WE publish this week the fifth annual report of the Dominion Telegraph Company of Canada, from which it will be seen that this company is proving highly successful. It is proposed during the coming season to largely extend its lines and increase its facilities, which is imperatively demanded by the rapid increase of its business. We believe this company to be well and honestly managed in the interests of its stockholders and the public, and are gratified to learn of its continued and increasing success and prosperity.

An Enterprising Firm.

THE attention of those who may have occasion to purchase telegraph instruments and apparatus, is called to the advertisements of Messrs. PATRICK BUNNELL & Co., of Philadelphia, which will be found in this number of THE TELEGRAPHER. This enterprising firm, we are pleased to learn, are doing a very good business. They deserve to succeed—the firm being composed of practical telegraphers, well and favorably known to the fraternity and the business public. They have recently enlarged their premises and increased their facilities, and are now prepared to fill all orders promptly and satisfactorily.

Personals.

THE address of Mr. CHARLES MAYNE is desired. When last heard of he was in Illinois. Any one who knows his present address is requested to address "Manager, Western Union Telegraph, Cromwell, Iowa."

Mr. J. J. FREY, heretofore Superintendent of the Sedalia Division, has been appointed Superintendent of

Telegraph on the Missouri, Kansas and Texas Railway, with office at Parsons, Kansas.

Mr. E. O. MARTIN has been transferred from the day to the night force in the W. U. Chicago office.

Messrs. WM. C. LONG, CHARLES FORTIER and GEORGE HALL, of the Pacific and Atlantic Chicago, Ill., office, were, upon the consolidation of the lines with the Western Union, transferred to the day force of the latter in the Chicago office.

Mr. ED. DENNIS, formerly P. & A. night manager, Chicago, Ill., was transferred to the night force of the W. U. office in that city.

Mr. H. GARNER, formerly of the Chicago P. A. office, has accepted a position as operator with the C. & N. W. Railway, Madison Division, at Tunnel No. 3, North End, Summit, Wisconsin.

Mr. N. B. WALKER has accepted a position as operator with the C. & N. W. Railway Co., Madison Division, at Tunnel No. 3, South End, Summit, Wisconsin.

Mr. J. H. F. SCHOLL, formerly in the Train Despatcher's office of the Central Railroad of N. J., L. & S. Division, at Mauch Chunk, Pa., has accepted the position of agent and operator for the U. P. Railroad, at Ogalalla, Nebraska.

The Telegraph.

The Dominion Telegraph Company.

THE annual meeting of the Dominion Telegraph Company, of Canada, was held at the executive office of the company in Toronto, Canada, on Wednesday, February 11.

The Hon. John McMurrich, President, presided.

The Chairman said that the directors and officers of the company had passed through another hard year's work, but with much less anxiety than on former occasions, as they had received more encouragement. He felt that the shareholders would be satisfied with the progress the company had made.

The fifth annual report of the directors was then read by the Secretary, Mr. Small. They congratulated the shareholders on the steady increase of business and profitable returns which the accounts exhibit, and the fair prospects for the coming year.

"The company was organized, and the first Board of Directors appointed in August, 1868. Seventeen months after, at the close of 1869, the company had been enabled to construct but 147 miles of single wire line, and to open six offices in that period; its growth has been steady and most satisfactory. In the course of the following year, 1870, the company had increased their mileage to a total of 629 miles of pole line and 1,116 miles of wire, with 35 offices. At the close of 1871 the company, including the purchase of the Quebec line, possessed 1,510 miles of pole line, 2,933 of wire, and 106 offices. During the course of the following year, the pole line mileage had been increased to 2,177 1/2 miles, the wire to 3,942 miles, with 164 offices.

"The new lines constructed during the year just closed consist of the following: From Sarnia to Kent Bridge, intersecting the London and Chatham line, over 59 miles; from Collingwood to Owen Sound, 39 miles; from Trenton to Picton, 32 miles; from Whitby, through Port Perry, to Little Britain, 36 miles; from Clinton, on the Goderich line, to Kincardine, 56 miles; from Brantford to the town of Simcoe and Port Dover, 33 miles; from Mount Forest, through Durham and Walkerton, to Kincardine, 50 miles; from Mount Forest to Harriston, 10 miles; and a short connection between Ottawa and Aylmer, making in all about 400 miles of new extension, with 633 miles of wire. These additions bring up the addition of the company's pole mileage to 2,585 miles, with 4,574 miles of wire and 251 offices.

"A portion of this increase of wire mileage has arisen from the addition of extra wire on lines already constructed, rendered necessary by the increased business of the company; and still further provision will have to be made in this direction, partly by additional wires on existing lines, and partly by new lines on fresh routes, not only to increase the scope of the company's business by embracing fresh districts where these lines are called for, but also to add to the facilities of existing communications between the business portions of the Provinces of Ontario and Quebec. The general manager has prepared with great care a sketch of the extensions referred to above, which it is most desirable should be provided for with as little delay as possible while the season is favorable for getting out poles.

"To make provision for these contemplated extensions a fresh issue of stock will be necessary, and the directors recommend that authority for this purpose be granted to the extent not exceeding \$100,000 for the year 1874, to be floated from time to time as the new works are proceeded with."

In conclusion, the directors express their satisfaction at the manner in which the General Manager, Mr. J. D. Purkis, continues to discharge the important duties of his position, and with the zeal and energy of the Secretary, Mr. Small.

The report of the General Manager, Mr. J. D. Purkis, was then read. He calls attention to the fact that, at least 500 miles of poles and 1,000 miles of wire will be required to be put up the coming season to meet the growing business, as well as to open up new routes and new offices in the Provinces of Ontario and Quebec.

He continues:

"You are aware that greater facilities are becoming more necessary every year to meet the steadily increasing requirements of the mercantile community and the press; and, in order to provide for these and to advance our own interests, we must continue our extensions and increase our wires. You are aware that the more extended our lines are the less will be the ratio of working expenses, and I have no hesitation in saying that the sooner your lines are extended, not only through Ontario and Quebec, but the Lower Provinces, the greater will be your success; but it has not been my aim to advise larger extensions during any season than I have felt we could place in proper working order.

"In order that the contractor may avail himself of the winter season to procure the poles, and to give time to import the necessary wire, it is most desirable that arrangements should be come to at once, or with as little delay as possible.

"So far, our success has been such that I feel confident you will cheerfully accede to my request, and provide the necessary means to carry it out."

With the exception of the interruption caused by the almost unprecedented storm of Dec. 23, 1873, and the sleet storm of Jan. 7th and 8th last, which did a great deal of temporary damage, but was repaired with all possible energy and despatch, the wires have worked during the past year with great regularity, and the lines are now throughout in good condition.

He closes his report with a graceful and deserved compliment to his assistants and the employes and agents of the company generally, who have, he says, "worked heartily and faithfully for the interests of the company."

A comparative statement of the number of messages sent during the years 1872 and 1873, showing an increase of 83,579 messages for the latter over the previous year.

The report of the directors was accepted after some remarks of satisfaction on the part of gentlemen present at its favorable character, and a motion "That the directors are hereby authorized to make a fresh issue of stock, not to exceed \$100,000, as asked for in the report," was carried.

Mr. Mackenzie, in commenting upon the report, said there was no difficulty which he could not see his way out of. By contracts between the railroads and the Montreal Telegraph Company the latter had secured exclusive right of way over their routes. It was very desirable and almost essential that this company should, especially when its lines were extended into the Maritime Provinces, have a similar privilege. He thought that the law of the country ought to give an equal right to all to construct telegraph lines along the railways. "The honorable Treasurer of Ontario has at present an amendment to the railways act before the local Legislature, and he thought the directorate of this company ought to consult with the Government upon this subject. He had no doubt but that, in justice to the country, they would give the amendment asked for. The importance of the subject would justify their approaching all the provincial governments with a similar request. He did not see why one telegraph company should be given a monopoly over another, or why two foreign express companies should be privileged to the virtual exclusion of companies which we could organize ourselves."

After further debate a motion was made by Mr. Mackenzie, which was carried, "That the Board of Directors be requested to enter into immediate communication with the Dominion and Provincial Governments for the purpose of securing to all telegraph companies in the Dominion the privilege of laying down their lines upon the different railways in the Dominion, and having the same facilities afforded to all on equal terms."

Sheriff Waddell moved a hearty vote of thanks to the President, Vice-President, Treasurer and Directors, for their attention to the interests of the company during the past year, which was carried.

The following gentlemen were then declared unanimously elected Directors for the present year:

Hon. John McMurrich, John J. Mackenzie, James Michie, Hon. Wm. Cayley, Lewis Moffat, Hon. T. N. Gibbs, S. Neelon, A. Copp and Wm. F. McMaster.

At a subsequent meeting of the new Board the Hon. John McMurrich was reelected President; Mr. John J. Mackenzie, of Hamilton, Vice-President; Mr. James Michie, Treasurer, and Messrs. M. H. Gault, of Montreal, and A. Joseph, of Quebec, were reappointed local Directors for the Province of Quebec.

AN ELECTRIC BELLE.—A female telegraph operator.

The best investment for a telegrapher.—Two dollars for a subscription to THE TELEGRAPHER.

Enlargement and Improvement of the Indianapolis, Ind., Western Union Telegraph Office.

The Western Union Company in this city has recently doubled the space occupied by the operating, receiving and Superintendent's departments. The operators have been removed to the fourth floor, corner room, which is well lighted, cheerful, and a great improvement over the old one. Calland batteries have taken the place of the Grove, some eight hundred cells being in use, divided into eight main batteries. Including duplex and repeaters there are about forty instruments in the operating room, the whole in charge of Mr. Winder, as chief, with Messrs Langhorne and Fuller as assistants.

The work of changing operating and battery rooms was done under the supervision of Mr. C. H. Summers, the company's electrician.

Mr. Whitney remains as right bower to Sup't Wallace, assisted by Hinsdale and Moulton, both big trumps.

Manager Butler is happy with Thomas at the books; Barnard as receiver, and Swain in charge of delivery. Brisbane bosses batteries, and John Hasty keeps the spurs of his climbers bright, and things straight generally.

Bold Forgery of an Official Announcement of Increase of Western Union Stock.

ON Tuesday afternoon an intense excitement was created on the floor of the New York Stock Exchange by the announcement of a proposed increase of the stock of the Western Union Telegraph Company to \$50,000,000—an addition to the existing capital of \$9,000,000.

A few minutes before one o'clock P. M. a messenger boy—one of the regular uniformed messengers of the Stock Exchange—handed a letter to Vice-President Wheelock, who read out the announcement that the Western Union Telegraph Company had increased their capital stock from \$41,073,410 to \$50,000,000.

The letter was as follows:

"WESTERN UNION TELEGRAPH COMPANY, }
New York, Feb. 17, 1874. }

MOSES H. WHELOCK, Esq., Vice-President New York Stock Exchange:

As required by the rules of the New York Stock Exchange, you are hereby informed that the Directors of this company, after mature deliberation, and acting, as they believe, in accordance with the ultimate best interests of the company, have decided to increase the capital stock of this company from \$41,073,410 to \$50,000,000. The proceeds of the sale of the additional stock, together with the proceeds of the sale of \$7,295,235 of stock lately in the possession of the company, will be expended in the repairs and improvement of the present lines, and the extension of the lines of the company to nearly all the post-offices in the United States, and for the establishment of a line to California and Mexico. The Directors beg to state that while the establishment of new lines may delay for a little the expected dividends to stockholders, they express a confident hope that by thus taking possession of the whole field, and effectually thwarting the establishment of a rival company, the ultimate value of the stock will be in no way diminished, and that reasonable dividends can be paid at no distant day. Yours truly,

WILLIAM ORTON, President."

This letter was written on the official paper of the Western Union Company. Directly after the reading of the above by Mr. Wheelock a second letter was handed to him, purporting to be from the President of the Toledo, Wabash and Western Railway Company, also announcing an increase of \$10,000,000 of the common stock of that company. This letter, like the first, was written on the official paper of the company.

The reading of these letters at once created intense excitement, and there was a tremendous pressure to sell stocks, especially of the two companies affected.

Two or three brokers, who were not carried away by the excitement, carefully examined the letters and at once pronounced them forgeries. The officers of the Exchange sent letters to the officers of the two companies, and soon obtained the following from President Orton, of the Western Union Company:

"NEW YORK, Feb. 17, 1874.

H. G. CHAPMAN, Esq., President New York Stock Exchange:

I have just learned an announcement has been made in the Stock Exchange that the Directors of the Western Union Telegraph Company have recently voted to increase the capital stock to \$50,000,000. This announcement has no foundation in fact. No meeting of the Directors has been held for several months, nor has the matter of the increase of the capital stock of the company been a subject of consideration at any meeting of the Executive Committee. Respectfully,

WILLIAM ORTON, President."

Information was also received from the transfer clerk

of the T. W. and W. Railway that the notification of increase of capital of that company was a forgery, and the excitement subsided.

In the meantime the shares of the Western Union Telegraph Company had declined nearly four per cent.; and, doubtless, the rascals who had concocted and carried out the nefarious scheme had managed to profit largely by the successful trick.

The Governing Committee of the Stock Exchange have taken measures to ferret out the villains, who, if detected, will be made to suffer for their villany.

President Orton stated to a reporter who interviewed him on the subject, after the excitement was over, that the company had no intention of increasing its capital stock, and has not had.

Foreign Telegraphic Notes.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom for the week ended Jan. 24, 1874, was 324,600—an increase of 35,427, on the corresponding week last year.

The West India and Panama Telegraph Company have been informed by Sir Samuel Canning, their engineer, of the successful completion by the Telegraph Construction and Maintenance Company of their duplicate cable between Jamaica and Porto Rico, and they state that the interruption on the Cuba Company's cable—the repair of which they hope to see announced in a few days—is now the only obstacle to direct telegraphic communication with the West Indies.

The Eastern Telegraph Company announce that their direct cable between Cornwall and Lisbon is interrupted, but messages are sent as usual by the duplicate line between these points *via* Vigo.

The final meeting of the United Kingdom Telegraph Company, for the purpose of receiving the report of the liquidator, and for winding up the company—its lines having been taken over by the Government as part of the postal telegraph system—was held at the London Tavern on the 26th of January. The balance sheet was unanimously accepted, and the chairman declared the company completely wound up.

Married.

CADMUS—BARKALOW.—On Tuesday, Feb. 17, 1874, at the residence of the bride's father, by Rev. H. M. Taylor, CHARLES A. CADMUS, of the Western Union Telegraph Co., Cleveland, Ohio, to ANNIE E. BARKALOW, daughter of Moses V. and Cornelia Barkalow, of Franklin, Warren Co., Ohio.

FALING—BARRETT.—In the City of Portland, Oregon, at the residence of the officiating clergyman, Rev. T. L. Elliott, Mr. CHARLES D. FALING, Supt. Telegraph O. & C. R. L., to Miss XARIFA J. BARRETT, all of Portland.

It is evident that the bridegroom's name is indication of his disposition; but who can blame him for having a "failing," as regards the young lady who has favored him with a "permanent connection," and, no doubt, he will be able to "barrett" not only with equanimity but pleasure. A solitary life must certainly, under the circumstances, have proved an unpardonable "failing" on his part had he continued it longer. May they live long and happily together with few "crosses" and no "breaks" to trouble them.

JONES—DIKE.—Mr. F. W. JONES, Asst. Chief Operator Western Union office, Chicago, Ill., to Miss ELIZA DIKE, operator in the same office.

STEWART—SCWALKA.—At Yreka, California, January 28, 1874, Mr. GRANVILLE Q. STEWART, of Yreka office, of the Western Union Telegraph Co., to Miss JENNIE SCWALKA, all of Yreka.

The matrimonial epidemic among the Pacific Coast telegraphers seems to be spreading. They evidently realize the fact that "It is not meet that man should live alone," and it is certainly an act of kindness on the part of the lady to take compassion on the loneliness of a telegraphic artist. May others find sufficient provocation to do likewise for such members of the fraternity as have not yet been provided with matrimonial engagements.

Died.

HARRIS.—At St. Paul, Minnesota, January 31, 1874, in the 24th year of his age, of hemorrhage of the lungs, GEORGE HARRIS, formerly Manager of the Pacific and Atlantic Telegraph Company in that city.

I thought my cup of grief was full,
But now it's running o'er,
Though I know my children are not dead,
But only gone before.

Three little ones were called away
To join the angel throng,
And now another loved one's gone
To swell the heavenly song.

My noble son gave up his life
To God, the just and right;
He did not live to suffer long—
God took him from our sight.

His MOTHER.

Obituary.

GEORGE HARRIS.

THE deceased, although but in his twenty-fourth year when he died, had been engaged in the telegraph business from his fifteenth year. He was a very excellent young man and a good telegrapher. His last telegraphic position was as manager of the St. Paul, Minn., office of the Pacific and Atlantic Telegraph Company, which position he filled acceptably and creditably to himself and the company.

In April of last year he was taken with hemorrhage of the lungs, for which he could not succeed in obtaining relief, and in

September last, by advice of physicians, went to California, but not apparently receiving much benefit, he returned to St. Paul. After his return for a time he seemed somewhat better, but gradually declined, and for the last four weeks of his life was unable to leave his bed.

He was beloved by those who were associated with him in business, and, so far as is known, he had no enemies. His funeral took place Feb. 3, from St. Mary's Church, St. Paul, and an affecting general sermon was preached by Rev. L. Caillet.

The deceased always felt much interested in THE TELEGRAPHER, urging it upon the attention and support of those with whom he was associated, and occasionally contributing to its columns.

He leaves a kind and affectionate mother, who is greatly afflicted at his death, and who has the sympathy of all who knew her son.

[From the N. Y. Tribune and N. Y. Evening Post.]

THE AMERICAN AUTOMATIC TELEGRAPH.

TO WHOM IT MAY CONCERN.

THE AMERICAN AUTOMATIC TELEGRAPH SYSTEM is now being operated in the United States of America by the AUTOMATIC TELEGRAPH COMPANY, under an agreement with a temporary license granted by me, the undersigned (on record in United States Patent Office, Liber J, 17, page 73, Oct. 21, 1873). I am ready to assign (conditionally) to responsible parties one undivided fourth part of all the foreign patents (including Canada) now in my possession. GEORGE LITTLE, C. E., Assignee and Sole Patentee, Bloomfield ave., Passaic City, N. J., U. S. of America.

TO TELEGRAPH SUPERINTENDENTS.

If you are fitting up SHORT LINES or CITY WIRES get PARTRICK, BUNNELL & CO.'S

CHAMPION SETS.

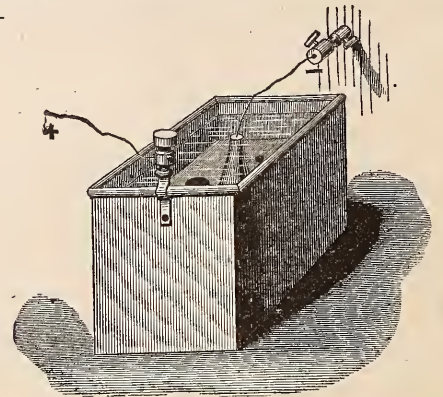
They are complete, full sized, work beautifully, don't get out of order, are substantial, pretty, and very low priced. Send for circular.

WILLIAM BROWNLEE,

Dealer in

CEDAR TELEGRAPH POLES,
DETROIT, MICHIGAN.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5603.)

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Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

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UNION BRAND, AND
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BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

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CABLES TO ORDER.

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LECLANCHÉ BATTERIES.

CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY Co.,

No. 40 West 18th Street.

New York, October 11, 1873.

NOTICE.

In order to save Express Charges to numerous customers for our "Champion Learner's and Short Line Apparatus," we are about establishing various agencies throughout the country, a list of which will soon be published. Those wishing Agencies will please send at once for circulars and terms.

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OUR PROFITS HAVING BEEN AMPLE,

WE OFFER OUR CUSTOMERS THE
BENEFITS OF THE RECENT
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IN THE COST OF LABOR AND MATERIAL.

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- " " HILL'S HOTEL ANNUNCIATOR and FIRE ALARM.
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IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3.....\$4 00
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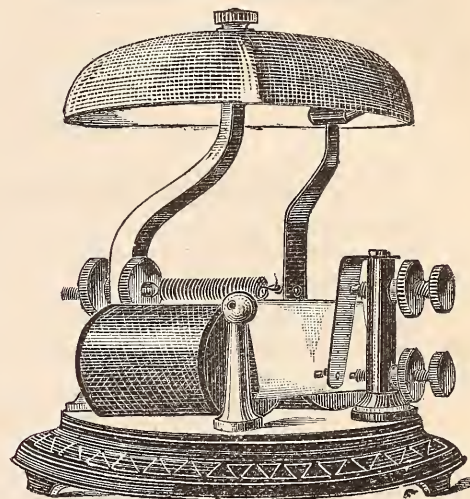
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One half of actual size

ELECTRIC BELL,

PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard.

Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight.. \$50 00

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St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The Automatic Signal Boxes.

Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original FARMER & CHANNING PATENTS, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, THREE CAN BE NO QUESTION.

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,
104 Centre Street,
NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
 DAVID BROOKS, Proprietor,
 22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
 Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
 No. 50 BROAD STREET (Rooms 12, 13 & 14).
 P. O. BOX 496.

A AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

EFFICIENCY AND RELIABILITY.

Address—
 American Compound Telegraph Wire Co.,
 ALANSON GARY, Treasurer,
 No. 234 West 29th St.,
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
 FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY
HOWARD WATCH AND CLOCK CO.

E. HOWARD, & CO., Proprietors.
 J. HAMBLET, Electrician.

OFFICES:
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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH

in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,

which is the best watchman's time recorder in the world. Also, ELECTRIC AND CONTROLLED CLOCKS

of all kinds,
 CHRONOGRAPHS,
 ASTRONOMICAL CLOCKS,
 REGULATORS,
 ETC., ETC.,
 OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES
 OF
 EVERY DESCRIPTION,
 38 VESEY STREET, New York.

NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS, SOUNDERS, REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
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THE NONPAREIL TELEGRAPH INSTRUMENT,
 For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
 Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

BRADLEY'S BOX RELAYS AND SOUNDERS.
BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.
 The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the Best and most Economical Battery, for telegraphic and other purposes, offered to the public.

Descriptive Circulars and Price List forwarded upon application to

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 (P. O. Box 5503.) 38 VESEY STREET.

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THE CHAMPION SETS
 MAKE THE BEST POSSIBLE OUTFITS FOR
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Full sized, perfect in all respects, and more substantial than any telegraph instruments ever before introduced.

PARTRICK, BUNNELL & CO.,
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POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL TELEGRAPH APPARATUS,

For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this Pioneer Low Priced Telegraph Instrument, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
 Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00

SEND FOR CIRCULAR.

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 [P. O. Box 5503.] 38 Vesey Street, N. Y.

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MANUFACTURERS OF

UNRIVALLED MORSE INSTRUMENTS

CHAMPION LEARNERS' APPARATUS,

with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,

Improved Curved Keys,

Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

DR. L. BRADLEY,
 No. 9 Exchange Place,
 JERSEY CITY, N. J.,

Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60. Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

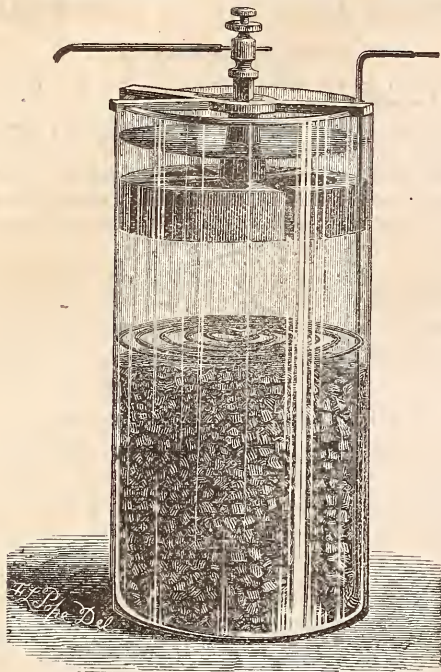
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-800th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any attention whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

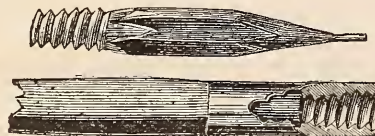
L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Send by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

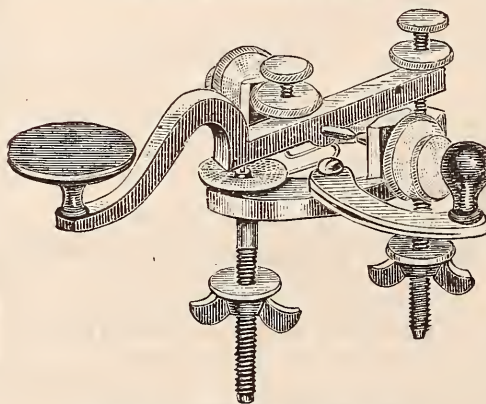
GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

WATTS & COMPANY,
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BALTIMORE,
MANUFACTURERS OF
ELECTRICAL AND TELEGRAPH INSTRUMENTS
AND
Material of Every Description,
RELAYS, KEYS, SOUNDERS, COMBINATION SETS, &c., &c.
Nickel Plated Goods a Specialty.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



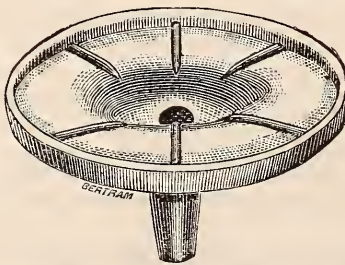
Price, \$5.50 plain; \$7 nickel plated.

The following is from a competent judge, written after some weeks' trial.

145 BROADWAY, NEW YORK, }
Sept. 22d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,
A. S. Brown, Manager.



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

SWITCHES, GALVANOMETERS, RESISTANCE COILS, &c., to order. Designs for Switch Boards for special service furnished.

SCOTT'S PATENT ANNUNCIATOR,
for Hotels and Residences.

THE BEST TELEGRAPH MATERIAL
IN THE WORLD
IS SUPPLIED BY
L. G. TILLOTSON & CO.,
8 Dey Street, New York,
MANUFACTURERS, DEALERS and IMPORTERS
OF
TELEGRAPH MACHINERY, SUPPLIES
AND
Line Equipment of every Description

MATERIAL AND INSTRUMENTS
always on hand, for the equipment of lines of any length, at a moment's notice.

We furnish first class goods at low prices. Liberal arrangements made with Superintendents, Contractors and Builders of Telegraph Lines.

Registers.....	\$38 00 to \$45 00
Spring Registers.....	47 50
Relays.....	14 00 to 18 00
Sounders.....	3 50 to 7 50
Keys.....	4 00 to 6 50
Main Line Sounders.....	14 00 to 18 00
Combination Sets.....	20 00 to 30 00
Galvanometers, \$7 00 upward.	

RATTLER TELEGRAPH SOUNDER, \$3.50.
POCKET INSTRUMENTS, Nickel Plated, in Hard Rubber Cases, 1 1/2x2 1/2 inches.
CUT-OUTS, Plug, Peg or Button, with or without Lightning Arresters, for one, two or more Lines.
JONES' PATENT LOCK SWITCHES, the best and cheapest in use, with or without Lightning Arresters.
PEG or PIN, CULGAN, REPEATING, GROUND, LOCAL, BATTERY and SINGLE BUTTON SWITCHES.
LIGHTNING ARRESTERS for any number of wires, of most approved patterns.

ELECTRO-MAGNETS, PERMANENT MAGNETS, APPARATUS for STUDENTS and AMATEUR TELEGRAPHERS ELECTRIC MOTORS, PRINTING and DIAL INSTRUMENTS,

ELECTRICAL ANNUNCIATORS, FIRE and BURGLAR ALARMS, ELECTRO-MEDICAL INSTRUMENTS.
RHUMKORFF COILS, from 1/4 to 10 inch spark.

GEISSLER'S TUBES, from \$1.00 upward
ELECTRICAL CALL and ALARM BELLS in great variety, from \$6.50 upward.

INSTRUMENTS furnished Nickel Plated at 20 per cent. advance on List Price.

OFFICE WIRES, from 80c. to \$1.25 per pound.
GUTTA-PERCHA COVERED WIRES, all sizes.
BISHOP'S NEW COMPOUND COVERED WIRE, for running into offices, 4c. per foot.

MAGNET WIRES, in Silk and Cotton, at Factory prices.
INSULATED WIRES for special purposes made to order.
SILK COVERED SWITCH CORD, one, two or more conductors.
PATENT MESSAGE HOOKS, the best ever introduced, prices 65c. and 75c. per dozen.

MANIFOLD PAPER and AGATE STYLUS at bottom prices.
CABLES AND SUBMARINE WIRES.
REPAIRERS' TOOLS and TOOL BAGS.
GLASS AND RUBBER WINDOW TUBES.
KENOSHA AND OTHER INSULATORS OF EVERY DESCRIPTION.
BRACKETS, PINS and SPIKES.

HILL, CALLAUD, GROVE, BUNSEN, CARBON, DANIELLS, LECLANCHÉ, NITRO-CHROMIC AND OTHER STYLES OF BATTERY IN ANY QUANTITIES.

PURE CHEMICALS at LOWEST PRICES.
SULPHATE OF COPPER a SPECIALTY, AND PRICES VERY LOW.

CARBON PLATES made to order for Grenil, Smee, Stohrer and other Batteries.

OFFICE FIXTURES AND BATTERY UTENSILS OF EVERY DESCRIPTION.

"Smith's Manual of Telegraphy," - - - 30 cents.

ALL STANDARD WORKS ON ELECTRICITY & TELEGRAPHY.
SOLE AGENTS FOR

RICHARD JOHNSON & NEPHEW'S CELEBRATED LINE WIRE.
Catalogue and Price List furnished upon application.
L. G. TILLOTSON & CO.,
8 DEY STREET, NEW YORK.

The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, February 28, 1874. Whole No. 398

CHARLES WILLIAMS, JR.,
109 COURT STREET, BOSTON, MASS.,
MANUFACTURER OF
TELEGRAPH INSTRUMENTS
OF ALL KINDS,
GALVANIC BATTERIES,
JONES' PATENT LOCK SWITCH,
PATENT ELECTRIC GONGS,
PRINTING TELEGRAPH INSTRUMENTS.
ALSO, ON HAND AND FOR SALE,
D. W. PUTT & CO.'S Mechanical Telegraph
Instruments,
"Pope's Modern Practice of the Electric Telegraph,"
AND A FULL ASSORTMENT OF
TELEGRAPH MATERIALS AND SUPPLIES.
AT THE LOWEST PRICES.

CANADIAN TELEGRAPH SUPPLY
MANUFACTURING COMPANY,
MANUFACTURERS OF
All kinds of Electrical Instruments
AND
TELEGRAPH SUPPLIES.
All orders promptly filled, at reasonable prices.
Office and Factory,
352 and 354 KING STREET, WEST,
Toronto, Ont.

WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
Western Electric Manufacturing Company,
CHICAGO.

CHARLES WILLIAMS, JR.,
(ESTABLISHED 1856.)
109 Court Street, Boston,
has for sale the various kinds of Office and Magnet Wires, in-
cluding Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and
DAY'S KERITE COVERED WIRE.

EUGENE F. PHILLIPS,
MANUFACTURER OF
REED & PHILLIPS'
PATENT INSULATED TELEGRAPH WIRES,
(PATENTED, NOVEMBER 18TH, 1873.)
Lock Box 169. PROVIDENCE, R. I.
Having recently enlarged our factory, we are now prepared
to furnish at short notice any style and quantity of
BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes
the most durable, handsome and best insulated Braided Wire
manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires
covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Com-
panies have been supplied from my works with a greater
portion of the office wire used by them.
Sample Card and Price List furnished when requested.
Phillips' Wire can be had of

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| CHARLES T. CHESTER |" |
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| THOMAS HALL |" |
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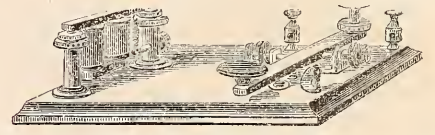
General Superintendent's Office,
AMERICAN DISTRICT TELEGRAPH CO.,
NEW YORK, January 1st, 1874.

E. F. PHILLIPS, Esq.
Dear Sir: Your office wire is a decided success. We have
used it exclusively for two years and consider it the best in the
market.
Respectfully,
W. H. SAWYER, Gen'l Sup't.

JOSEPH MOORE & SONS,
(Established 1820.)
535 & 537 CHINA STREET,
(Below Green St.) PHILADELPHIA, Pa.,
MANUFACTURERS OF

INSULATED WIRES.
OFFICE WIRE—Plain, Braided, Prepared, &c.
INSTRUMENT WIRE—Cotton and Silk Covered, &c.
FLEXIBLE CORDS, all kinds, &c., &c.
We warrant all Wire to be of the highest conductivity, tested
by our Galvanometer, which compares with the tests of the
highest authority in this country.

TILLOTSON'S EXCELSIOR
TELEGRAPH INSTRUMENT.



(PATENTED JUNE 24, 1873.)
This apparatus is constructed of the best material, and finished
equal to any Telegraph Instrument, and is warranted first class
in every particular. It is especially adapted to the require-
ments of Students of Telegraphy and the operation of Private
Telegraph Lines.
Price, complete, Sounder and Key mounted on finely
finished Mahogany Base, with one Cell Hill's Patent
Battery, with Chemicals, eight feet of Office Wire, and
"Smith's Manual of Telegraphy"..... \$7 50
Two sets..... 14 50
Price of Sounder and Key only..... 6 50
" " " " with Cut Out and Lightning
Arrester attached..... 7 50
SEND FOR CIRCULAR.
L. G. TILLOTSON & CO.,
NO. 8 DEY STREET, N. Y.

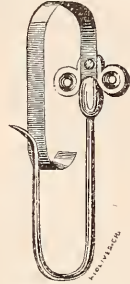
PATRICK, BUNNELL & CO.,
OF PHILADELPHIA,
are daily in receipt of letters from everywhere, pronouncing
their
CHAMPION SETS
to be just what they are named,
"CHAMPIONS OVER ALL COMPETITORS,"
and really worth six to one, as serviceable and pretty instru-
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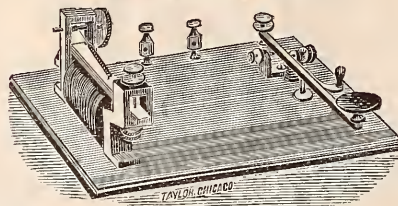
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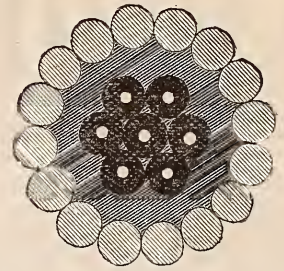
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A JOURNAL OF

ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, FEBRUARY 28, 1874.

VOL. X. WHOLE No. 398.

The Page Patent Litigation.—Answer of the Manhattan Quotation Company.

The answer of the Manhattan Quotation Company to the complaint in the suit of Priscilla Page, administratrix, etc., and the Western Union Telegraph Company, which suit is intended to establish the validity of the patent granted to Charles Grafton Page, and subsequently, on the 10th day of October, 1872, reissued to the plaintiffs, has been filed in the Circuit Court of the United States for the Southern District of New York.

The answer admits the Act of Congress under which the application of Prof. Page was made, and letters patent issued to him, but denies that said Act of Congress conferred any power, right or authority for issuing said letters patent as issued, or that Page then, or at any time thereafter, was the original and first inventor of certain new and useful improvements in induction coil apparatus and circuit breakers, being the same inventions and improvements which are more particularly described in the said letters patent, or that the same had not been known or in use by others at or prior to the time of the alleged invention claimed to have been made by Prof. Page, or that, by virtue of granting and issuing of said letters patent, he became the owner of said inventions and improvements, or thereby acquired any exclusive rights and privileges, as set forth in the complaint; but that, on the contrary, said inventions and improvements were previously known and described by divers and sundry persons in one or more printed publications and otherwise, and were described, claimed and held by divers and sundry persons under letters patent in this country and Great Britain; for which reasons defendant claims and insists that the said letters patent, so issued to said Charles Grafton Page, are null and void, and ask the Court to so declare.

It is also denied that, by the assignment and transfer by the said Priscilla W. Page, the Western Union Telegraph Company became the owner of or acquired any interest in the improvements and inventions enumerated and described in said letters patent.

The defendant avers and will insist that the surrender of the original patent was not for any sufficient, lawful or valid cause, nor for the reason that the specification attached to said first mentioned letters patent, and forming a part thereof, was so defective or insufficient as to render them inoperative and invalid under the statute in such case made and provided; and that the Commissioner of Patents had no lawful jurisdiction or authority to receive and cancel the said letters patent under said alleged surrender, nor to issue the said reissued letters patent, dated October 10, 1871; and denies that the said amended specification attached to the said reissued letters patent is more full, clear or exact than the original specification attached to the original letters patent. *And the defendant states and insists that the said amended specification, and the said reissued letters patent, include and contain more and other matters than the improvements and inventions described in the said surrendered letters patent, or in the application of Prof. Page, on file in the Patent Office on the 19th day of March, 1868, and include new and additional matters, improvements and inventions, more and other than was ever claimed to have been discovered or invented by the said Page, and that said amendments of said specifications were not confined to remedying the defects therein, within the meaning of the statute in such case made and provided, and do not conform with the description, specification or claims of inventions, improvements or discovery (claimed to have been made) of said Page, in his application on file in the United States Patent Office, March 19, 1868, and in the said letters patent of April 14, 1868, but, on the contrary, important parts of said descriptions and specifications, original, of said Charles Grafton Page, are amended, modified and suppressed, with intent to mislead, deceive and defraud, against the statute in such cases made and provided; for which good and sufficient reasons the defendant claims that said reissued letters patent are and were null and void, ab initio.*

The answer specifically denies the statements of the complaint of the plaintiffs of wrongful infringement of the letters patent, and loss and damage arising therefrom.

And for a further and separate answer and defence to the allegations of the complainants, the defendant answers, upon information and belief, "That prior to the 19th day of March, 1868, and on the 2d day of February, 1854, the said Charles Grafton Page, claiming to have invented and made discovery of certain new and useful improvements in induction coil apparatus and in circuit breakers, made application for letters patent therefor to the Commissioners of Patents of the United States Patent Office, and which said application was on February 23d, 1854, rejected and denied by said Commissioner of Patents, upon the ground and for the reason assigned, that said Charles Grafton Page was then an Examiner of Patents in the United States Patent Office, and thereby, under the law in such cases made and provided, disqualified of the right of receiving and obtaining letters patent of the United States; and also for the further reason assigned, that said Charles Grafton Page, prior to holding such position of Examiner of Patents, and a long time subsequent to the time of the alleged inventions for which he then made application for letters patent, had made known and abandoned to public use the said improvements and inventions by him claimed to have been made as aforesaid, and that the same or material parts thereof had been long known and in public use with his knowledge and consent."

The defendant further states that, under the Act of Congress by which the disabilities of said Page were removed, and he was authorized to apply for and received a patent, he did renew his said application "for letters patent for his induction apparatus and circuit breakers," then "on file in the United States Patent Office, including therewith his circuit breakers described by him prior to said application," and that subsequently said Page amended his application, then on file as aforesaid, as follows:

WASHINGTON, March 31, 1868.

HON. A. M. STOUT,
Acting Commissioner of Patents.

SIR—I desire to amend my application for letters patent for the induction coil and circuit breakers, now pending before the Patent Office, as follows, to wit:

Before claim first insert as follows:

The spark arresting circuit breakers may all be used as independent or detached circuit breakers, and these, and likewise all the independent electro-magnetic instruments hitherto used and described by me, for opening and closing circuit with other instruments, may be operated by batteries separate and independent from the batteries which operate the circuits to be opened and closed. In fact, this often becomes necessary when the circuits of the two instruments are largely disproportioned in length.

In using, for instance, the electro-magnetic circuit breaker called Barlow's spur-wheel, described by me in Volume XXXI, page 141 of Silliman's Journal, it becomes much more efficient when used with a separate battery.

Insert, after claim 13, as follows:

The employment of one electro-magnetic instrument to open and close the circuit of another electro-magnetic instrument, using either one battery for both or separate batteries for each, substantially as set forth.

The employment of separate and independent batteries to operate an electro-magnetic circuit breaker and the circuit which is broken by it, substantially as set forth.

CHARLES G. PAGE.

That subsequently the Commissioner of Patents issued to the said Page the letters patent of the United States, numbered 76,654, bearing date April 14, 1868, and which said letters patent were not issued upon the said application, on file at the date of approval of said Act of Congress (as required by said Act), but upon the amended application, made as aforesaid, as are fully made to appear by reference to the specifications and claims in said letters patent, and the said application on file March 19, 1868, and that the said amended specifications and claims were made with intent to deceive and mislead, and in fraud of the rights of other parties, and that they did and do embrace improvements and inventions not of the said Charles Grafton Page, and for which the said Page could not lawfully obtain letters patent of the United States, and for issuing of which no right, power, or authority was conferred under said Act of Congress, and for which letters patent of the United States had been theretofore issued to Samuel F. B. Morse, to wit, reissued Letters Patent No. 117, dated June 13, 1848, and which said improvements and inventions, or substantial and material parts thereof, were known and described by the said Samuel F. B. Morse in said last mentioned letters patent; that said amendments, added as specifications and claims under said instrument, dated March 31, 1868, were not intended, nor do they describe or refer to induction apparatus in circuit breakers described by the said Page, prior to his said application theretofore made, and then on file as aforesaid, but were interpolated as an attempt to obtain rights and privileges other than these defined by

or contemplated by said Act of Congress, and that said Act of Congress defined and limited the rights thereby intended to be conferred upon the said Charles Grafton Page to the removal of existing disabilities for the specific and special purpose therein designated and the Commissioner of Patents having exceeded the authority therein conferred and granted in issuing said letters patent, the defendant claims that they are null and void.

And for further and separate answer and defence to the allegations of the said complainants in their said bill of complaint contained, said defendant answers, and upon information and belief states and avers the facts to be, that prior to the date of said letters patent of the said Charles Grafton Page, No. 76,654, dated April 14, 1868, and prior to his alleged making or discovering any of the said improvements and inventions so patented to him as aforesaid in said letters patent, and as well also as in the said reissued letters patent made known, described and claimed, to wit:

The opening and closing of one circuit by another—the employment of separate and independent batteries in combination with an electro-magnetic circuit breaker, and the circuit broken by it—the combination of a set screw with the armature of an electro-magnet—the combination of an electro-magnet, armature, and adjustable retractor—a self-acting circuit breaker combined with a primary coil alone, or with a primary and a secondary coil combined—a mechanical circuit interrupter in combination with a primary and a secondary coil combined—an induction coil, the secondary circuit of which is two or more times the length of the primary circuit, and with several connections so made that the shocks or sparks produced by said coil may be regulated—a coil composed of a primary and a secondary circuit, in combination with both a mechanical and an automatic circuit breaker—a self-acting circuit interrupter in combination with two helices enclosing an electro-magnet—an adjustable self-operating circuit interrupter combined with a primary and a secondary circuit enclosing a compound electro-magnet—an attached vibrating circuit interrupter combined with two helices or circuits enclosing a compound electro-magnet—a self-acting circuit breaker with an adjustable retractor, and many other useful inventions, improvements and devices connected with the art of telegraphy—and claimed by the complainants as secured to them under and described in their said reissued letters patent—and substantial and material parts severally thereof, and the application of principles, mechanism and devices therewith essentially connected, were severally well known, in use, and were described in one or more printed publications, in this country and in foreign countries, as well also as in caveats and letters patent of the United States, and to which the defendant prays that examination and reference may be had, viz:

In the caveat filed in the U. S. Patent Office on or about Oct. 6, 1837, by Samuel F. B. Morse.

In U. S. patent dated June 20, 1840, granted to Samuel F. B. Morse.

In English patent No. 7,390, dated June 12th, 1837, granted to William Fothergill Cooke and Charles Wheatstone.

"Taylor's Scientific Memoirs," vol. 1, p. 534.

"Philosophical Magazine," October, 1835, p. 307.

"Sturgeon's Annals of Electricity and Magnetism," vol. 1, p. 297—1837.

"London, Edinburgh and Dublin Philosophical Magazine," vol. 12, p. 19—1838

Pamphlet—"Description of the American Electro-Magnetic Telegraph," by Alfred Vail, in 1845, pp. 9, 10 and 12.

"London Mechanics' Magazine," vol. 28, 1st series, pp. 124-125.

"Amer. Jour. of Science," vol. 19, 1831, pp. 400-403.

" " " " 20, 1831, pp. 202-203.

" " " " 20, 1831, p. 340.

" " " " 22, 1832, pp. 403-408.

Lectures of Professor Joseph Henry (now Secretary of the Smithsonian Institution, Washington, D.C.), in Princeton College, New Jersey, about the year 1834.

The defendant prays that these may be produced in Court, and proper proofs thereof may be made, to wit: The several applications by the said Charles Grafton Page filed and made to and with the Commissioner of Patents, and in the United States Patent Office in Washington, and the specifications and claims by the said Charles Grafton Page therein made and signed—the said Act of Congress of March 19, 1868—the said Letters Patent issued to Charles Grafton Page, dated April 14, 1868—the said assignment, executed by Priscilla W. Page, administratrix, dated January 9, 1871—the instrument of (alleged) surrender, executed by the said Priscilla W. Page, as administratrix, dated September 21, 1871—the application thereafter made and signed by the said Priscilla W. Page, as administratrix, or by her attorney, for reissued letters patent—and the reissued letters patent issued to complainants, dated October 10, 1871, and copies of the file wrappers and contents severally with each filed, as by said reference and proofs, when so made, will more fully

appear, whereby this defendant alleges and avers that sufficient facts are shown to render and make null and void, both for irregularity and want of proper and legal authority in any one acting or claiming to act as Commissioner of Patents, the right to accept a surrender of said letters patent, or the right to issue said reissued letters patent, for which reasons, good and sufficient, said defendant claims and will insist that said reissued letters patent, dated October 10, 1871, were unlawfully issued and without lawful warrant or authority, and are and were null and void ab initio, and ask your Honors to so decree.

Reply to Prest. Orton's Statements in regard to Relative Expense of Constructing and Operating Automatic and Morse Telegraph lines.

OFFICE OF THE AUTOMATIC TELEGRAPH CO.,
80 BROADWAY,
New York, February 8th, 1874.

To the HON. JNO. A. J. CRESWELL,
Postmaster General.

SIR: In a communication addressed to the Postmaster General, hearing date the 6th of December last, and published in the daily journals on the 27th, the President of the Western Union Telegraph Company used the following language in relation to the Automatic System of Telegraphy:

"It would require 24 perforators, 48 copyists, and at least three more to attend the transmitting and receiving instruments and the perforators, making a force of 75 (which he subsequently enlarged to 80) to accomplish in an hour the work performed with 16 operators, on 8 wires, by the Western Union in the same time.

* It would be decidedly cheaper for the W. U. to provide and maintain seven additional wires between Washington and New York, than to maintain such a force at both places as would render it possible to transmit and deliver, by the Automatic process, 12,000 words within an hour of the time of filing."

These statements are clear, concise and unqualified, and, emanating from the President of the W. U. Co., are invested with an authority which otherwise would not attach to them.

If they can be sustained—that is, if the assumption is correct that the well known defects and deficiencies of the English or Wheatstone Automatic system, so clearly and succinctly set forth by him, are applicable to the American Automatic system—I shall be forced to admit that the last "four years of constant trial, during which large sums of money have been expended in practical experiments," with which he so unkindly reproaches us, and to which we plead guilty, have been expended in vain.

He admits that the transmission, by the American system, has been increased from comparatively few words per minute to 12,000 words, in 20 minutes, over a single wire. Is it not barely possible that "four years of time and large sums of money" may have developed other improvements, whereby the fatal defect of five Automatic operators to one Morse may have been overcome, and even have gone so far as to justify the assertion that, with a like number of equally skilled operators, much more may be accomplished in any given time by Automatic than by Morse, and at a largely reduced cost?

It would be a waste of words to meet assertion merely by counter assertion. The only effectual mode of testing the question was by a public demonstration in presence of disinterested and unimpeachable witnesses, who should note the time and number of operators engaged in the work.

The transmission of the President's last annual message by the Western Union in 80 minutes, as reported by some of their employés—in 70 minutes, as announced in the *Tribune* on the morning after the performance—and in 59 minutes, average time, was pronounced "a feat unparalleled in the annals of telegraphy," which he declared to be impossible of performance by the Automatic system with less than 75 or 80 operators.

To accomplish this masterpiece the Western Union used the Morse system, 8 wires and 16 of their most accomplished operators.

It must be admitted that, to fully and fairly demonstrate the merits of the two systems of Morse and Automatic, the manipulators of each should be equal in experience and practice.

The Western Union has a corps of 5,000 operators, more or less, from which to select, many of whom, from long years of practice and experience, have attained a degree of professional skill and ability unequalled in any other country.

The whole corps of automatic operators, including the Morse operators who manipulate the wires, and the perforators and copyists, distributed in their several offices in New York, Philadelphia, Baltimore and Washington, aggregate but twenty-one persons. The first are excelled by none; the latter class comprises various degrees of efficiency, though none with sufficient practice to be classed as experts.

To enter the lists under these disadvantageous conditions, in competition with the Western Union, with their accumulation of wires, their consummate skill, long experience and thorough organization, with our twenty-one comparatively inexpert operators and our single wire, was a step which required consideration and justified hesitation on our part, the more especially as any other or less standard than that "unparalleled feat" was not permitted us.

The Automatic Company, however, after due deliberation, determined upon a trial, notwithstanding it would subject our daily business to much inconvenience and delay, and thereupon the requisite number of perforating instruments were sent to Washington, and on Monday, the 26th January, a sufficient number of operators were congregated in the respective offices at Washington and New York, and, to meet our supposed necessities, we were obliged to impress into service, as copyist, an office lad, and four unaccustomed outside temporary assistants.

They numbered, one transmitter, one receiver, ten perforators, and thirteen copyists—an aggregate of twenty-five operators.

The trial took place on the following day, and the result, as per report of our manager, copy of which I have the honor to enclose, together with the certificates of the gentlemen who kindly noted the operations, shows the whole time occupied from beginning to conclusion, to have been sixty-nine minutes, as against their seventy minutes; and the average time fifty-five and a half minutes, as against their average of fifty-nine minutes; with a declaration that, "with the experience gained in this demonstration, I am confident that we could readily dispense with at least two perforators and three copyists, and yet perform a like amount of work," and he might have safely added that, with the experts practice and experience are sure to develop, a like amount of work may be accomplished with about one half the number used on this occasion.

Thus is his charge of numbers disposed of. In regard to cost of operating force, I estimate their sixteen operators

At \$100 per month.....	\$1,600	\$19,200 per annum.
Automatic transmitter and receiver (Morse operators)		
2 at \$100.....	200	
23 perforators and copyists at \$40.....	920	
	\$1,120, or \$13,440	

Difference in favor of Automatic... \$5,760, or 30 pr. et. which favorable difference will be materially increased with thorough experts.

That there may be no misapprehension on the point of numbers or operating cost, let it be borne in mind that an Automatic operator can, with equal facility, perforate or copy, as the exigencies of business may require, thereby rendering it unnecessary to maintain a double force.

As a commentary upon this overwhelming result as to time, number of operators and relative cost, I place in juxtaposition his assertion, that "It would be decidedly cheaper for the Western Union to provide and maintain seven additional wires between Washington and New York than to maintain such a force at both places as would render it possible to transmit and deliver 12,000 within an hour of time of filing."

I present to you a statement, based upon Western Union data, of the cost of providing and maintaining additional Morse wires, except that I have stated the cost of wire \$25 per mile below their usual estimates.

On the 12th December last, as you are aware, in presence of yourself and other gentlemen, we transmitted from Washington to New York, over our one wire, about 12,000 words in twenty-two and a half minutes; by no means, let me assure you, an "unparalleled feat" with us.

The Western Union required eight wires and one hour for like service. Therefore, our Automatic wire was thus shown equal in capacity to twenty Morse wires.

If, therefore, there is sufficient business to require twenty Morse wires (and the W. U. has, I believe, more than forty leading from New York south), we can do a like amount of business on one wire.

From New York to Washington, by direct line, the circuit is, say, 250 miles.

Extra Morse wires to supply a capacity equal to one Automatic wire, 19.
250 miles : 19 : 4,750, at \$75.... \$356,250 00 add'l. cap.

7 per cent. annual interest	24,937 50
His last annual report states the annual cost of maintenance and repairs at \$8.66 per mile of wire.	
Accepting his own data,	
4,750 miles additional wires,	
\$8.66.....	\$41,135 00

Annual cost of providing and maintaining additional Morse wires, equal in capacity to one Automatic wire..... \$66,072 50 which would be more than 50 per cent. on the whole Automatic investment.

With but seven additional wires, which will be fully occupied while our one wire will be occupied but one half the time:

250 : 7 : 1,750 miles, \$75.....	\$131,250 00	add'l cap.
7 per cent. interest.....	\$9,187 50	
Annual maintenance and repairs, 1,750 miles, \$8.66.....	15,155 00	

Annual excess over Automatic, exclusive of economies in operating..... \$24,342 50 or more than 20 per cent. on the whole Automatic investment. Extend this over the United States and estimate the result; comment thereon is unnecessary.

The President of the Western Union Company in his last annual report, declared:

1st. That at times all their wires between principal points were fully occupied.

2d. That telegraphic business in the United States "is still in its infancy."

3d. That the number of messages was rapidly increasing; thus, the number sent in 1866-7 was 5,800,000, and in 1872-3, 14,456,832; to which latter should be added the large number sent by the independent companies organized since 1867.

In his argument before the Washburn Committee he stated that an increase of business, assuming existing wires to be occupied, would necessitate a corresponding increase in the number of wires (of course, with the Morse system).

A growing business which, with the Morse system, would be constantly demanding more wire, might swell a thousand per cent. before the necessity for an additional wire would be created, if operated upon with the Automatic system. And when it is considered that each additional wire, say to Chicago, costs from sixty to seventy-five thousand dollars, or to New Orleans double that sum, the enormous economy of the Automatic system demonstrates itself.

In relation to current expenses of operating, we shall employ the highest Morse skill in manipulating our wires; but I beg you to bear in mind that each operator will accomplish from ten to twenty-fold more with the Automatic than with the Morse.

To attain expertness as a Morse operator requires several years of close application and constant practice, and but few of those who attempt it reach the highest class. Such are entitled to high compensation.

To attain expertness as a perforator and copyist is within reach of the many in a comparatively short time, and, therefore, such may be had at a much less average compensation, while the product will exceed the average attained by the Morse operator; and, lest the question should be raised, I assert that we can drop copies in any number of offices at will.

This demonstration was simply to determine whether the criticisms to which the English system of Automatic telegraphy may be obnoxious are applicable to the American system. I contend that the result justifies me in asserting that they are not; and furthermore, that "the four years of constant trial and large sums of money" which have been expended to accomplish cheap telegraphy, acknowledged to be beyond the reach of the Western Union Co., have not been expended in vain.

The overwhelming advantage of the Automatic over the Morse system, in the comparatively small amount of capital required—say one fifth; its economy in operating—say a clear saving of one third; in the enormous difference in the maintenance and repairs—say as two wires are to thirty; in interest, etc., etc., will be demonstrated, in due time, by uniformly low tariffs, which we believe will be satisfactory to the public, and meet all just demands for cheaper telegraphy.

In view of the opinions expressed in your annual report, that, "as soon as it (the Automatic system) shall be thoroughly developed and applied in practice, the problem of cheap telegraphy will be definitely solved," I have taken the liberty to thus submit for your consideration this evidence of the actual practical condition of that system which, in my judgment, shows that the problem of cheap telegraphy has already been solved; and, permit me to add, that its practical application to circuits between the principal commercial centres of the country had been definitely arranged.

With great respect,
I have the honor to be,
GEORGE HARRINGTON,
President of the Aut. Tel. Co.

Past hope—the possibility of a Government telegraph system in the United States.

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Claims of Military Operators to Bounty Land. —How not to Effect their Recognition, and How it can be Secured.

WASHINGTON, D. C., Feb. 21.

TO THE EDITOR OF THE TELEGRAPHER.

"AGITATOR," in THE TELEGRAPHER of this date, expresses a desire to know "what has been done to bring the claims of military operators before Congress," and frequent inquiries on this subject evince a general feeling on the part of those interested to have the matter pressed to a final decision by the proper authorities. Last session an ex-military operator—whom no one in this city ever heard of before (or since)—came down upon Congress with a flourish of trumpets and an avowed determination to immediately secure a farm for every one of the telegraphers who had served the government during the war. A bill to effect this object was introduced in the House, and referred to the Military Committee, before which the diplomatic stranger agreed to appear and make such explanations as might be required. When the time for the meeting came he was "doing" the city in a hired hack, and the committee never saw him. The bill was referred to a sub-committee of one. Before Congress met again the sub-committee and the bill were both dead. While the bill was pending somebody suggested, through THE TELEGRAPHER, that military operators should each write a letter to the member of the committee having it in charge, and, accordingly, numerous heroic effusions found their way into the government waste baskets. A repetition of this performance now seems probable, and will doubtless result in just as little good. Congress is not apt to vote away money or lands without knowing how much is required, and who is to get it, and any legislator, in considering a bill for the relief of the military telegraphers, will at once ask "how many of these men are there?" "Were they soldiers or civilians?" "When and where did they serve, and what compensation did they receive?" and other questions of a similar nature. Until the members of the old military corps can send some one here who can explicitly state all the facts relating to the service, any attempts to get bounties will be a waste of time. The work of collecting and arranging the necessary data can be best executed by a committee composed of men who served in various divisions of the army, who are familiar with the work performed, and know where to find the records. If the men in different localities will consult together, and select members of such a committee, the matter can speedily be set going. As a representative of the operators of the Army of the Potomac, no better man than A. B. Chandler can be found.

MILITARY.

Causes Tending to Control Compensation to Operators.

TO THE EDITOR OF THE TELEGRAPHER.

In attempting to explain the reasons producing the effects in this most preguant subject I shall only deal with facts which have presented themselves to me during my eight years' experience of actual practice as an operator. The causes are so diversified that it will be impossible to give more than the leading ones—supply and demand, generally, and locality. Taking present salaries as effect, cause is the point I will discuss. The supply of operators is always in advance of the demand. This gives the employer the power to regulate salaries to his own advantage, because if the operator won't work for the remuneration, others can easily be found who will. All subordinates, as a rule, are bound to run the cost of their department to the lowest figure in order to hold their own position. The Superintendent who can reduce the working expenses of his department, while performing the same or necessary amount of actual work, is sure to stand high in the estimation of his superiors. To such an extent is this carried that the proper handling of business is seriously impaired on numerous lines. That salaries are gradually being lowered I have no doubt. In numerous instances, when a change has been made in operators, the office has paid from five to ten dollars less than previous to the change, and that my assertion is true the frequency of these cases confirm. Operators usually learn their business while young—from 15 to 20 years of age. The principal reason of the number of learners is, that there are few occupations which, with so short time of preparation, will enable them to earn as high wages as telegraphy—taking into consideration their youth and qualifications. I find that eight out of ten operators I meet learned with the intention of following it the few years that most young men are prac-

tically a nonentity, as a pleasant and, to them, very lucrative business, and, when 22 or 23 years of age, engaging in other more steady and profitable occupation. Very few persons entertain a correct idea of the immense number of students there are being turned out monthly. I have no hesitation in asserting that there are two operators (without reference to qualification) in this country for every situation. You will say yes, but not good operators. Exactly; and the reason is this: on account of the unlimited supply of operators, salaries are kept at a rate which offers little inducement for a man to remain an operator after he has arrived at an age at which he can bend his energies to a more profitable (not respectable) business. In the Eastern and Middle States, railroad telegraph operators, with no other duties, are paid at an average of \$45 nights; \$50 days Western States, \$50 nights; \$55 days; and in the Far West, \$65 to \$80 and \$90. Locality has little to do with the salaries of commercial operators, who receive \$60 to \$80 as good operators, experts receiving from that up to \$125. Salaries in the extreme East are usually below the average. In regard to the student question I will make a suggestion. Frequently we hear complaints of the College nuisance. I claim that there are ten students turned out by the operators themselves to one by schools. As an example: On the wires I am on, I can count nine learners inside of forty miles. Will the operators never realize that by taking students for friendship or a "consideration," they are keeping their own salaries down to board and clothes? Each one says, oh! my student will make no difference. But hundreds are doing this. Take my advice—have no more students, and discountenance it in every possible way. It may make no perceptible difference for a time, but will show in two years to your advantage.

I will elose with a few remarks on a Telegraphers' National Association. Such a body must and will be organized in a short time. It will prove a benefit to employer and employé in many ways. It will bring the telegraphers into more intimate relation with each other; induce more pride in their occupation; be a medium of interchange of ideas, good will, useful information; and last, but not least, a means of protection in case of any aggravated oppression by employers. I discountenance strikes, believing them useless, and that desired results may be reached by far easier ways than through their agency. A thorough organization, with unanimity of action, is itself power, and every operator should be brought in. To do this we must have a means of exchange of ideas, plans and discussion, which should be THE TELEGRAPHER, and to produce the most beneficial results the largest circulation possible is necessary. Let every operator who reads this endeavor to secure one, two or three new subscribers, and if one out of five succeed it will be an important help and aid to us. Let us agitate this association in an earnest manner. I have an idea, or plan of one, which, at some other time, I may feel justified in bringing forward. Now, wake up! let the experienced operators, old hands, and others as well, send us their "Tel." As Mae says: "If it were done, when 'tis done, then 't were well it were done quickly."

DON JUAN.

The Fate of the Pittsburg P. & A. Employes.

PITTSBURG, PA., Feb. 23.

TO THE EDITOR OF THE TELEGRAPHER.

THE article in your last issue relative to the exit of the P. & A., prompts a reply from this "Smoky City," the hub of the defunct company, and where the "melancholy days" fell with a leaden weight upon many poor "artists," likewise the "plugs." And it seemed a fitting time that the miserable corporation should perish. A continuous rain had rendered the wires incapable of carrying the last "Good night" to the East. Eastward the heavens frowned, as if to indicate the fitting termination, while to the West all was clear and cheerful, plainly indicating the wisdom of the late Horace Greeley's advice. Thus we were enabled to manifest a feeling of sincere regret, because of the apparent separation of friends, but with no regrets that the company, as a company, had ceased to be. Speculative quarrels among the officials pronounced the company's doom, and were it not for the employés, it was well it died when it did. And, Mr. Editor, this consideration for the employés reminds me of a grievous injustice done "the boys" by Mr. Orton, which, if I mistake not, was premeditated. I was privileged to see a letter from that gentleman to Mr. McCargo, wherein was this emphatic assurance: "You can assure all your employés a continuance of employment." There was no discrimination. This assurance was, to my mind, calculated to prevent desertion from the ranks prior to the consolidation, and to my certain knowledge it served the contemptible end. Many were content to await the time when "a continuance of employment" would be proffered them, who, had they displayed more discretion than confidence, would not be found to-day asking for the charity of their more fortunate associates. That is, there were men who had positions prof-

ferred them by men who anticipated the speedy consolidation, and who were willing to aid them. But the operators in this city knew of Mr. Orton's emphatic assertion, and placed implicit confidence in it; therefore, preferring positions with the Western Union to almost any other company, the men declined the proffered assistance of their true friends, and the dire misfortunes that hang, pall like, over them to-day, is a lesson from which words of profitable instruction may be gleaned. And yet Mr. Orton is an honorable man. There are many other facts of a similar character known to the writer, but as none of those who directly feel the results are prone to ventilate a just indignation and condemnation, I am content to "let the dead past bury its dead," and in a spirit of cheerful submission proceed to exume the loved and lost from the graveyard of the past.

Our Ex-General Superintendent may be seen perambulating our streets in the role of Macawber. Mr. Hamilton, the Chief Operator, and Mr. Ledwith, Assistant Chief Operator, have each in turn renounced telegraphing—the former going to Boston and the latter to the rural districts, to engage in commercial life. Mr. Prescott, Night Manager, has taken his "Q," and with his accustomed vigor is wrestling with "Old Prob.'s" in the Western Union. Mr. Fiteb, the inimitable "Ra," with Mr. Byrnes, "B," and Mr. Myers, "Ku," are "toiling knights." Miss Bunnell, "N," and Mr. Marshall, "M," are a part of the bright concatenation of day artists, for which "G" has long been noted.

Those who may exclaim with Othello, "my occupation is gone," are Mr. Mathias, "M S." (who deserved a better fate); Mr. Pollock, "P;" Mr. McBratney, "Mc;" Mr. Barelay, "Mr.," and Mr. Walters, "Mgr." Mr. Editor, having briefly noted the whereabouts, without specifying the condition of "the boys" of the late P. & A., in this city, I shall decline into obscurity until a spirit of manly independence shall animate their dormant sensibilities. Then, and not until then, will the telegrapher in his individual capacity be what God has created him—a man—and not what the miserable interrogatory of the petty officials have made him—"What are you but the willing tributary to the accomplishment of our desires?"

RODERIC DHU.

The Resignation of Mr. Joseph F. Hibbard.

MAUCH CHUNK PA., Feb. 21.

TO THE EDITOR OF THE TELEGRAPHER.

WE regret to announce to the readers of THE TELEGRAPHER that Mr. Joseph F. Hibbard, who so well and creditably to himself filled the office of Chief Operator for the Lehigh Valley Railroad Company, Mauch Chunk, Pa., has, on account of ill health, resigned his position and gone to his home. During his sojourn with us he had, by his many acts of kindness, won for himself many true and admiring friends, who will miss him as he now ceases from our society, and in his absence the company will lose one of their very best men—a man who was well calculated to fill the position he held. Yes, we will miss him, but we cannot bid him remain in detriment to his health.

We hope for his speedy recovery, and when he is again called to fill another field of usefulness our best wishes shall be with him for his success. We can never forget the many happy days spent in his society, and in the long, long years that are to come our hearts will recall his memory with tears of sorrow.

J. W.

The "Snapper" Sounder.

NEW YORK, Feb. 24.

TO THE EDITOR OF THE TELEGRAPHER.

TEN years ago, while in the employ of the American Company in a New England city, I dropped in at a printing office to deliver "Good night." Sauntering about the office, in company with Fred Fairchild, I picked up a printer's rule which lay upon the imposing table, and noticing that it was worn very thin, I bent it slightly, when a familiar "click" was heard—a perfect down and back stroke. I wrote a few words in Morse with it to my companion, and we agreed that it was a pity that such a novelty should remain hidden in the rubbish of a printing office, so I slipped it into my pocket. A vigorous search for it was made after our departure, but the next day when the owner learned what a treasure it was in the heart of every operator who saw or heard it, he kindly relinquished his claim to it. I showed it to Mr. Lundberg, an instrument maker, in San Francisco, who made a number of them, but they were not equal to the original. Mr. Martin Wessman has now completed an improvement, by which a complete mechanical sounder is being manufactured, embodying the principle of the original "snapper," which I have made arrangements to mail to my address for thirty cents, as advertised in another column of THE TELEGRAPHER.

R. W. POPE.

An electric shock—a refusal of a matrimonial proposal by telegraph.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, FEBRUARY 28, 1874.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of **THE TELEGRAPHER** will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The Tenth VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the TELEGRAPHIC FRATERNITY,

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An Unwise Policy.

It is always an unwise policy to underrate a competitor. A very striking illustration of this is shown in the attempt made by the President of the Western Union Telegraph Company, in his letter to the Postmaster General, to demonstrate the inadequacy of the Automatic to compete with the Morse telegraph system. The statements in regard to the relative expense of performing a like amount of telegraph service by the two systems afforded the managers of the Automatic Telegraph Company an opportunity to exhibit by actual performance, in the presence of numerous persons, Western Union officials and others, the advantage of their system, of which they promptly and very properly availed themselves. The letter addressed by the president of that company in his turn to the Postmaster General, which we print in our columns this week, contains facts and figures which will, no doubt, prove interesting if not satisfactory to Mr. ORTON and his associates. They refute in the most complete manner the suppositions, and utterly unfounded data by which the latter endeavored to prove that the Automatic was in fact more expensive, and possessed no compensating advantages over the Morse. We do not propose to repeat here the data by which Mr. HARRINGTON has so completely and effectually demolished the arguments and assertions of his antagonist. They will, no doubt, receive proper attention and consideration from our readers

Mr. ORTON has again placed himself in a most mortifying position. His previous experience in regard to the Duplex should have taught him more caution, and have caused him to take counsel not alone from his wishes, and what he supposed to be the immediate interests of the great telegraphic corporation, of which he is the executive. In the case of the Automatic system that demonstration has followed more quickly than in that of the Duplex, but, if possible, it is even more complete and effectual than in the latter. If in the course of time it should become possible and practicable for the Western Union Company to adopt the Automatic system, we presume that we shall find Mr. ORTON as positive and enthusiastic, if not even more so, in proclaiming the importance and paramount value of the latter as of the former.

Mr. ORTON does not, so far as we are informed, claim to be either a scientific or practical telegraphic expert, and of course depends upon others to advise him in such matters. We should suppose that he must be satisfied that he has been badly advised, and led into giving his authority to statements and assertions which, as the representative of the great telegraphic organization of the country, place him in a very unpleasant predicament. It must be evident to him, as it is to everybody else, that he has stated as demonstrated and demonstratable that which is neither. It seems to us that he cannot afford to let the matter rest in its present shape. The Western Union Company has an organ which is supposed to represent the views and sentiments of the managers of the company. These statements and assertions have been made in its columns, and circulated wherever that paper is read. That Mr. ORTON is now satisfied that they were incorrect we presume will not be disputed. It would seem, then, that in all fairness that fact should be acknowledged through the same channel. Unpleasant as it may be to do this, it would be far more manly and honorable than to persist in what is privately admitted to be, to put it in the mildest form, an error.

We are not the special advocates of the Automatic system or of the Automatic Telegraph Company, but we endeavor, in these columns, to treat all electrical and telegraphic matters with equal and exact justice and fairness. We knew the statements made by Mr. ORTON to be erroneous, and therefore, as the conductor of a telegraphic and scientific journal, considered it our duty to put the matter in its proper light, without reference to the parties concerned or to their relative telegraphic positions. For Mr. ORTON personally, and for the Western Union Company, we have no unkind

or antagonistic feeling or prejudice. All telegraph companies and systems are alike to us. It is not our province to exalt or extol one above another, or to seek to advance unduly the policy and interests of one over another. THE TELEGRAPHER is, and always has been an independent telegraphic journal. Whatever there may be to commend in the Western Union or any other telegraphic organization and system, it gives us pleasure to commend. Whenever criticism and condemnation is necessary, as regards any telegraph company or system, we fearlessly and impartially criticize and condemn. This is in no sense the organ of any telegraph company. So far as it may be regarded as an organ at all, it is that of the practical telegraphers, whether employed by the Western Union or any other telegraph company. We can therefore speak freely and with all possible kindly feelings in regard to this matter, and while we do not presume to advise Mr. ORTON, we would say to him that it is due to himself that he should acknowledge the error into which he has been led, and manfully and honestly undo, so far as possible, the injustice which he has attempted to do to the Automatic telegraph system. The facts are now generally well known, and silence on his part must unavoidably be construed as practical acknowledgment of error, and as exhibiting a desire to avoid a more open and manly course. The interests of his company cannot be advanced thereby.

The Prospects for Telegraph Business.

THE winter of 1873-74 is about over, and the spring business should now be fairly under way. We hear, however, that the telegraph business is unusually dull, and the prospect for an active business during the season does not as yet promise very fairly.

This has been a hard winter, and telegraph as well as other business has suffered from the rude shock which the panic of last fall inflicted. It was hoped that before this time the worst effects of it would have been over, and business have resumed its wonted activity. Such is not the case, however, and we must confess that the indications are that the business of the season upon which we have just entered is likely to be very much restricted. The telegraph business, of course, sympathizes very intimately with the other business of the country, and until there is a general revival of that, it cannot expect to be as active and remunerative as otherwise. The restriction on general business is shown by the accumulation of unemployed capital at the financial centres, and the low rates of interest at which this can be obtained on call or short time. The uncertainty which exists as to the policy which will be adopted by Congress in regard to financial matters, is one cause of the hesitancy to engage in extensive business transactions. The financial question appears to be a very perplexing one to our Congressional Solons, and a great contest is going on at Washington between the inflationists and those who desire to limit and contract the irredeemable paper currency of the country, with a view to a return to a sound financial system. If further inflation should be decided upon it would undoubtedly make things lively for a time, and the telegraph as well as other business would experience a temporary renewal of activity, but it would be but temporary, and followed by another financial crisis, much more severe than the one we have just passed through. It is better to make haste slowly in this matter, and unpleasant as may be the present situation, to work out of it by degrees, and recuperate on a sounder basis than that upon which we have been doing business during the past ten years. It will, no doubt, take longer to get things into a satisfactory shape, and important telegraphic projects may be delayed, but in the end it will be much more beneficial for all concerned. The resources and productive capacity of this country are too great to allow of any protracted business prostration, and it is a question of but comparatively brief time when with a proper system of finance we shall again be busy and prosperous. Let us all have patience, be economical in our expenditures, and careful and conservative in our business

projects and arrangements, and the good time coming will not long be delayed. Telegraphic enterprises will again be pushed forward, and telegraph business be active and remunerative.

The Deficiency in the Postal Revenues.

THE estimated deficiency in the revenues of the Post-office Department for the next fiscal year will be not less than seven millions of dollars, and this notwithstanding the franking privilege is abolished, and everything that passes through the mails is ostensibly paid for by stamps, even to the official communications on the business of the department itself. The express business, in which the department has engaged, has proved unprofitable, and has enormously increased the bulk of the mails without a corresponding and compensating increase of its revenues. The post-office should pay its way, but instead of approximating towards it, the deficiency in revenue in proportion to expenses annually increases. In his desire to bring under his control as much of the business of the country as possible, Mr. CRESWELL went in for the light express matter and got Congress to authorize its transmission at nominal rates. It is a losing business, of course, and an effort is now being made in Congress to get rid of it again. Whether it will be successful remains to be seen. The rates of postage have been reduced to unremunerative figures, in the effort to introduce in this country, and under such vastly different conditions, the policy which naturally has resulted more favorably in the smaller and more densely peopled countries of Europe.

It only remains now, to complete the matter, to add the telegraphs of the country to the postal establishment, and everything would be lovely and satisfactory. Even in Great Britain it has been found impracticable to make the telegraphs, as a Government institution, pay. In this country the pecuniary result would be even more unfavorable. Mr. CRESWELL, or his successor, would have to meet Congress with a deficiency of fifteen to twenty millions of dollars annually, instead of six or seven, and incur besides the curses loud, deep and constant from the public, whom it would be impossible to satisfy with any red tape administration of the telegraph. Fortunately for the people, the Postmaster General and the Government, we are to be spared this additional infliction. Postal or Government telegraphy is dead, for some years to come at least, and though it may give an occasional spasmodic struggle, it is incapable of any vigorous demonstration. It may be and probably will be brought up as a peg to hang a speech on occasionally, or to cut the spite of some newspaper against an offending telegraph company, but it is essentially moribund, so far as this country is concerned. So note it be.

The Migratory Proclivities of Telegraphers.

It's perhaps but natural that telegraphers should desire to travel and see the world. That they do so desire there is constant evidence. A private letter, received from one of our correspondents in a far eastern country informs us that the publication of his name in THE TELEGRAPHER, as holding a responsible telegraphic position, has overwhelmed him with letters from telegraphers in this country, seeking to obtain positions on his lines. To these, of course, he cannot reply individually, but his advice to one and all is to stay at home. The experience of others who have been prominently connected with telegraphs in Central and South American countries, is similar.

We also frequently receive letters from telegraphers, asking for information as to how they shall proceed to obtain situations on foreign lines and in foreign countries.

To all who may be afflicted with this migratory fever, we would repeat the advice which we have heretofore given in these columns, to get rid of it at once. Whatever may be the disadvantages under which telegraphers labor here, they are better off in every respect than they would be in any other country.

They are better paid and more comfortably situated, and not one in twenty of them, if their desire for a change could be gratified, but that would bitterly regret it in a very short time. Under the most favorable circumstances but few telegraphers are fitted or calculated to succeed on foreign lines, and they would find that their condition would be much worse than in this country. Stay at home and try to improve your condition here, and in the end you will be in every respect much better off than if you became wanderers in strange lands and among alien people.

The Success of The Telegrapher.

THE TELEGRAPHER is the only paper published in the world which depends upon the telegraphic fraternity directly for its support, and which specially represents the interests of practical telegraphic workers. As such it has special claims to their personal interest and support, and appeals to them to take an active personal interest in maintaining and increasing its circulation. Its columns from week to week afford indisputable evidence of progress and improvement, and we think it may be said without egotism that it is creditable to the telegraphers of the country. Its prospects never were so good as at the present time; but, notwithstanding this, it does not have so extensive and general a support as it should. Its circulation should be at least 5,000 weekly, and we do not propose to be satisfied until it reaches at least this figure.

We would ask every telegrapher into whose hands it may come, to take a personal interest in extending and increasing its circulation. With a little effort on their part its circulation can easily and speedily be doubled. Will our friends take these suggestions into consideration and act promptly and energetically, as canvassers and agents?

The Page Patent Litigation.

WE print this week a synopsis of the answer of the Manhattan Quotation Company to the complaint of the Western Union Telegraph Company, in the suit instituted to establish the validity of, and enforce the Page Patent. This synopsis covers the important points, and exhibits the grounds upon which that patent is resisted. It clearly demonstrates the utter worthlessness of that patent, and the outrage which its enforcement would be upon the public. It will be found of much interest to all who are concerned in the matter, as who, whether telegraphers, owners of telegraph property, or patrons of telegraph lines, is not?

Crowded Out.

SEVERAL articles, communications, etc., intended for publication this week have been unavoidably postponed on account of the space occupied by the synopsis of the defendant's answer in the Page Patent litigation, and the letter of President HARRINGTON, of the Automatic Telegraph Company, to Postmaster General CRESWELL. Our friends must have patience with us, and they shall all have a chance to be heard as speedily as possible. The interest which is manifested in THE TELEGRAPHER of late is highly encouraging, and there is abundant evidence that it is generally regarded not only as increasingly influential, but as the recognized authority in telegraphic matters and electrical science in this country.

Geo. H. Bliss & Co.'s Telegraphic Manual.

WE have received from GEORGE H. BLISS & Co., of Chicago, a copy of the excellent little *Telegraphic Manual* furnished by them with their telegraphic apparatus, especially that designed for students and amateurs. Within a small compass it imparts a large amount of telegraphic instruction, which will be found valuable and interesting.

In it will be found a new alphabet, prepared by Dr. E. A. HILL, the electrician of the company, whose ability and proficiency are well known, which is very simple, and can be easily acquired by novices. The condensed manual, prepared by Mr. GEORGE H. BLISS,

in a series of short exercises instructs the student from the beginning in the telegraphic art, and carries him along by familiar illustrations and examples to the regular business of sending and receiving commercial and railroad despatches. This manual is not printed for sale, but will be furnished on application to GEORGE H. BLISS & Co., 41 Third avenue, Chicago, Ill.

The Longest Piece and Largest Coil of Telegraph Wire in the World!

Messrs. L. G. TILLOTSON & Co. have on exhibition at their salesrooms, No. 8 Dey street, a single piece of No. 8 galvanized iron wire, without joint or weld, which measures nine thousand nine hundred feet (nearly two miles).

This piece of wire was manufactured by Messrs. RICHARD JOHNSON & NEPHEW, from a bar of their iron which was awarded the prize medal at the Vienna Exposition. The JOHNSON wire has attained a world wide reputation for its long lengths, tensile strength and high conductivity, and is now the standard wire in every country using the telegraph.

A New Feature.

WE shall next week commence the weekly publication in THE TELEGRAPHER of the highest and lowest daily quotations of the shares of such telegraph companies as are dealt in at the New York Stock Exchange. This will prove a new and valuable feature, and we have no doubt will be appreciated by our readers throughout the country.

[From *The Ghost*.]

Old Jim Lawless.

Poor old boy! the western pines wave over his grave now. He has been dead some time. I don't remember just what took him from us, but as he was "Jim" to everybody, and prone to go on "jams" in spite of all opposition, I have a suspicion that it was a combination of the two. He didn't work at the business for several years prior to his decease; certain disturbances with telegraph managers and railroad superintendents had rendered him unpopular with employers, and he had officiated in a Cheyenne restaurant—with bar attached—up to within a short time previous to his death. But neither in this field of enterprise was he entirely successful. On the Chicago, Burlington and Quincy, an attempt, while train despatcher, to pass two trains on the same track, had worked his ruin. Dropping into a beery slumber, which lasted until daybreak, while he was attending a button repeater at Corinne, had resulted in a similar disaster. His troubles with trains and repeaters ended, however, when he quitted the service, and he thought he had gravitated to his level in the "hash and jig water business," as he facetiously termed it, and he confidently looked forward to less turbulent scenes and experiences. But one day the proprietor, who had just refitted the saloon in gorgeous shape, went to Omaha to see about a new mirror, and left Jim "chief in charge." The next day several kegs of new ale arrived, and Jim was busy all day getting them in. In the evening his friends found him unusually genial and generous, and they unanimously responded in person to his cherry invitation to "Drinkwymeboys, whasserods." In attempting to tap one of the new arrivals the bung flew out of the keg, and for a moment the air was fragrant with its contents. All that new paper, the mirror and its drapery of brocade and tassels, the pictures over the bar, everything around wept tears of hops and malt. Jim gave the newly garished room one sorrowful look, and it sobered him instantly. Then turning to his friends, he said: "Good-bye, boys, there goes another situation," and, like the "Tall Alcalde,"

"He strode him out of the adobe door,
And ne'er was seen or heard of more."

by Cheyenne eyes or ears, at least. There was a legend floating about Red Buttes in 1870, which assigned him to the position of a water drawer for the railroad at a station near there; I can't vouch for the truth of it, but certain it is he dropped out of telegraphing some years ago and died engaged in some lowlier pursuit than ours.

But Jim Lawless was the biggest kind of a telegrapher. I've seen the whole of them work; know them all by heart, and there never was a man who snatched brass that could touch him. I'll tell you what he did in Savannah, Ga. Old "Dad" Sullivan was in Charleston, and in those times "Dad" could average about eighty-three words a minute. He got Jim the first night Lawless struck the town, and Jim had been

around the block, and was so drunk the boys had to prop him up in his chair; but he sat there and took three hundred and eleven messages without a "break," besides a short "special" for the *Savannah News*. Sullivan did his level best. And the copy Jim took! gilt edged, copperplate; couldn't be "rushed" out of it any how. And talk about copying behind! Why, that night when "Dad" said, "N. M.—ur no slouch. G. N.," old man Jim was three social messages, a government "cypher" and the short "special" behind. The boys all stood around and watched him, and after he gave "O. K." and signed, he went right on and copied out all that stuff he had laid back in his head. Jim used to take "State Press" at Albany a long time ago, when they sent it abbreviated—E for "of the," "tt" for "that," "ts" for "this," etc. Most of the men took it by registers, but Jim just took it by sound, and wrote it out in full. The editors never saw such copy, and the proprietors of the paper offered him \$3,000 a year to take charge of their subscription books. One night when he was taking "State," Syracuse called up and wanted to know if he could deliver a message to the Chief of Police. Jim told him "yes," and took it, and told New York to go ahead. Then he jumped up and walked over to the Police Station, stopped into a little "dive" there is right there by the Delavan House, got a "schooner" and two "ponies" of beer, and came back to the office, and he "sat in" and went to copying, and caught up with New York before he got "30," though he got four hundred words behind while he was gone. These are only a few of the stories I can tell you about Jim Lawless, but these ought to suffice. I never encounter a crowd of operators but what some one will tune up about "Hank" Somebody, "Sandy" This, or "Nick" That, and their appalling achievements, and as I know for a positive certainty that Jim Lawless was the best operator that ever struck a key, I couldn't refrain from giving one or two of his feats publicity. JOHN OAKUM.

Personals.

Mr. E. V. ELLIOTT, of the Superintendent's office, Central R. R. of N. J., has accepted a position in the Superintendent's office, American District Telegraph Co., 516 Broadway.

Mr. H. MCGONEGAL has been transferred from the 19th district, 516 Broadway, to the managership of the 41st and 44th districts, A. D. T. Co., Sixth avenue.

The Telegraph.

By Cable.

LAUNCH OF A NEW CABLE STEAMER.

LONDON, Feb. 20.—The *Faraday*, a steamship of 5,000 tons burthen, built for Siemens Brothers, for the purpose of laying telegraph cables, and especially the new Atlantic Telegraph Cable for the United States Direct Co., now being manufactured by them, was launched at Newcastle to-day.

BRAZILIAN NAVAL AID TO CABLE ENTERPRISE.

HAVANA, Feb. 23.—Advices from St. Thomas report the arrival there of the Brazilian man-of-war *Vital Olivia*, to take soundings for the St. Thomas and Rio Janeiro telegraph cable.

American District Telegraph Company.

THE American District Company have just purchased of Messrs. Ferris & Brown, 164 Fulton street, for the use of Mr. Pope's department, six volumes of insurance maps of New York city, at a cost of 350 dollars. These maps are drawn on a very large scale, bound in atlas form, and comprise all that portion of the city south of 72d street. By means of a geographical index, any house in any portion of the city can be instantly referred to, and its complete description obtained. The maps show location and number of skylights, kind of buildings, height, location of hydrants, fire alarm boxes, and, in fact, everything that is useful and necessary in a business so full of details.

The Babcock Manufacturing Company are building a sample extinguisher carriage. If satisfactory, a number will be ordered.

Officers Brownlow and Mulvaney, of the 41st District, captured two burglars, at 2 A. M., Washington's birthday.

The Sixth District office, 31 Nassau st., has been opened for night service, and a sufficient number of policemen have been detailed to that district for duty.

A DESPATCH has been received by the District Attorney of New York, stating that forged Western Union Telegraph bonds to the amount of \$100,000 have been passed on the London market. It is reported that Walter Sheridan, alias Ralston, was the negotiator.

Foreign Telegraphic Notes.

It is proposed to establish a telegraphic line between the port of Corinto and that of San Juan del Sur, Nicaragua.

The receipts on the Eastern telegraph Company's lines for the month of January last amounted to £37,037, and for the same month in 1873 to £33,287.

The receipts on the Eastern Extension, Australasia, and China Telegraph Companies' four separate lines amounted for the month of January last to £20,717, against £16,523 in the month of January, 1873.

The directors of the Anglo-American Telegraph Company have decided not to renew the attempt to recover the 1865 cable until next year, when they expect to be able to fit out an expedition comprising the most efficient staff, and the ships best adapted for the purpose, neither of which can be had this season.

Anglo-American Telegraph.

THE report of the directors just issued shows that the total receipts for the eight months since the amalgamation of the company to December 31 last were £547,900. The working expenses, including income tax, were £218,810, leaving a net revenue of £329,090. This sum enables the directors to pay a dividend at the rate of 6 per cent. for the eight months, and carry forward a balance of £9,030. The reserve fund of the company now amounts to £251,940. The company also possess 900 miles of deep sea cable, forming a portion of the length manufactured for the cable laid last year, and which, by change of the route from Halifax, as originally intended, to Newfoundland, has been saved to the company, and will be available for completing a fifth cable, at no distant day. The company have also 126 miles of core in stock, capable of being made into a cable. This new fifth cable has already been taken in hand, a contract having been entered into with the Telegraph Construction Company to manufacture and lay 1,100 miles of new cable for the sum of £475,000, the greater portion of which will be paid from the working reserve fund and surplus profits, and the balance will be provided for without any permanent increase of the capital of the company.

This action on the part of the company will further add to the risk to be run by the competing schemes which, from time to time, are attempted to be forced upon the public. The "light cable" project, of which so much use has been made of late, will, it is rumored, be definitely brought forward during the ensuing week. Considering that the experiment is wholly untried, while all the experience of the past is against its success, and considering the vast losses already incurred by investors in similar competing schemes, it is to be hoped that the public will not be led into embarking capital in an enterprise so full of risk.—*The Railway News*.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended January 27, 1874, and bearing that date.

No. 146,641.—BURGLAR AND HOUSE ALARM. Richard M. Billings, Townsend, Pa. Application filed June 27, 1873.

Battery and alarm connected to three circuits, viz: Burglar, connected to doors and windows; day, to bell pull; and one to a clock for an alarm at a determined time. Gong and hammer both adjustable.

1. The combination, in an electric alarm, of a gong adjustable upon a vertical standard, and a horizontal and adjustable lever for striking this gong, all substantially as and for the purposes herein set forth.

2. The combination with a single battery and alarm apparatus of a circuit and circuit closing devices for a burglar alarm, and a circuit and circuit closing devices for a day or door alarm, and a switch for throwing one system in and the other out of connection with the battery and alarm, substantially as and for the purposes herein set forth.

3. The combination, with an electric alarm, of a clock connected to said alarm, and provided with perforations on its face, within which a pin is inserted, and against which pin one of the clock hands comes in contact, and thereby closes the circuit and causes the electric gong to sound, substantially as and for the purposes herein set forth.

No. 146,695.—UNDERGROUND TELEGRAPH LINE.—William Mackintosh, New York, N. Y. Application filed February 27, 1873.

The wires are attached to drawheads, by which they are drawn from reels and through underground troughs extending between vaults, which are open to the surface of the ground. The ends of the troughs extend within the vaults, and are made flaring and provided with side openings or doors, the ends being closed by plates of insulating material. The wires are supported at suitable distances in the troughs by notched bars, laid one upon another—one for each layer of wires—and are connected to tension screws passing through the insulating plates, the outer ends of these screws being connected with those of succeeding sections by wires in the vaults.

1. The combination of the insulating guide plates G, the insulating supporting bars g, the drawhead M, and the reels E, with the hollow trunk sections, and the working vaults C, all constructed in laying underground telegraph wires, substantially as described.

2. The drawhead M, in combination with a series of separate

and distinct layers of telegraph line wires, and an insulating entering plate G, whereby all the wires are drawn and laid in the trunk simultaneously as described.

3. In underground telegraph line wires, in which the trunk A is combined with working vaults C, wit in which the trunk projects, the combination therewith of the entering guide insulating plates G for the wires, essentially as described.

4. In combination with this entering guide insulating plates G, arranged within the trunk terminus D, as described, the tension adjusting screws F, supported by said plates, substantially as described.

5. The ends D of the trunk sections within the vault made flaring, to afford working room between the wires, substantially as herein described.

6. In combination with the flaring projecting ends D of the trunk sections within the vault, the working openings f within said sections, to effect the union of the line wires with the interior ends of the tightening screws F, as described.

Born.

BERRYMAN.—At St. Catharines, Ontario, Canada, to Mr. John BERRYMAN, Jr., station master and operator Allanburg Junction, Great Western Railroad, a son—an eight pound *souder*.

A SOUNDER FOR 30 CENTS.

THE "SNAPPER,"

a Mechanical Sounder and Key combined—giving a remarkably sharp and clear sound—weighs but half an ounce, and can be carried in the vest pocket.

EVERY OPERATOR, EVERY AMATEUR, EVERY STUDENT wants one. Sent post paid on receipt of THIRTY CENTS.

R. W. POPE,

GOLD AND STOCK TELEGRAPH COMPANY, 61 Broadway, N. Y.

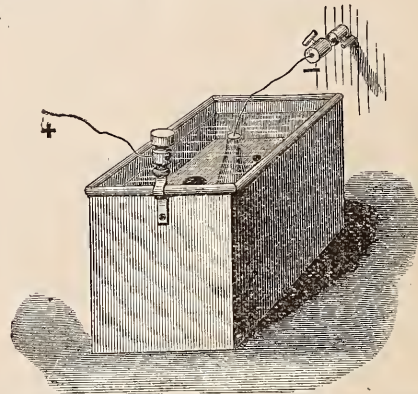
TO TELEGRAPH SUPERINTENDENTS.

If you are fitting up SHORT LINES or CITY WIRES get PARTRICK, BUNNELL & CO'S

CHAMPION SETS.

They are complete, full sized, work beautifully, don't get out of order, are substantial, pretty, and very low priced. Sent for circular.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.) 38 VESEY STREET, N. Y.

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WESTERN ELECTRIC MANUFACTURING COMPANY.

No. 220 KINZIE STREET, CHICAGO.

TELEGRAPH, WIRES, INSTRUMENTS,
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Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND
UNION BRAND EXTRA QUALITY.

JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS.

KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

Western Electric M'f'g Co., Chicago.

LECLANCHÉ BATTERIES.

CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY Co.,

No. 40 West 18th Street.

New York, October 11, 1873.

NOTICE.

In order to save Express Charges to numerous customers for our "Champion Learner's and Short Line Apparatus," we are about establishing various agencies throughout the country, a list of which will soon be published. Those wishing Agencies will please send at once for circulars and terms.

PARTRICK BUNNELL & CO.,

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OUR PROFITS HAVING BEEN AMPLE,

WE OFFER OUR CUSTOMERS THE
BENEFITS OF THE RECENT
REDUCTION

IN THE COST OF LABOR AND MATERIAL.

ALL WHO NEED

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WILL CONSULT THEIR OWN INTERESTS BY PURCHASING FROM US.

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IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER,
No. 3.....\$4 00
- A WELL FINISHED AND GOOD WORKING SOUNDER,
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- A WELL FINISHED AND GOOD WORKING KEY, No. 4. 4 00

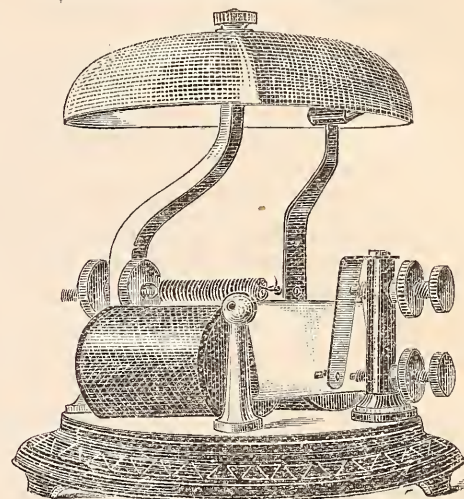
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One half of actual size

ELECTRIC BELL,

PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard.

Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight. \$50 00

Sounders, from..... 4 50 to \$6 50

Electric Bells, single stroke or continuous ringing,

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PATENT ELECTRIC WATCH-CLOCK
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At prices which defy competition.

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Battery Carbons all sizes, with Improved Connection
MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS,
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1,500 OPERATORS AND MANAGERS WANTED

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WITH A CENTRAL OFFICE,

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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
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The Distinctive Features of these Systems of

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ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

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IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, THERE CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in **Fire Alarm and Police Telegraphy**, upon application as above.

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104 Centre Street,
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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

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AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**, with Patent Platina Connection, introduced by us eight years since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single DANIELL cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made.

Our **CATALOGUE**, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH
INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
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P. O. BOX 496.

A MERICAN COMPOUND
TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

EFFICIENCY AND RELIABILITY.

Address—
American Compound Telegraph Wire Co.,
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DIAL TELEGRAPH,
FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY
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This Instrument is offered to the public as the oldest, most rapid, and best.

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in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,
which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS
of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
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OF
EVERY DESCRIPTION,
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NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,
For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the
EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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MAKE THE BEST POSSIBLE OUTFITS FOR
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Full sized, perfect in all respects, and more substantial than any telegraph instruments ever before introduced.

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REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL
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For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
Two sets of Instruments, etc..... 12 00

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with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,

Improved Curved Keys,

Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

DR. L. BRADLEY,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60. Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

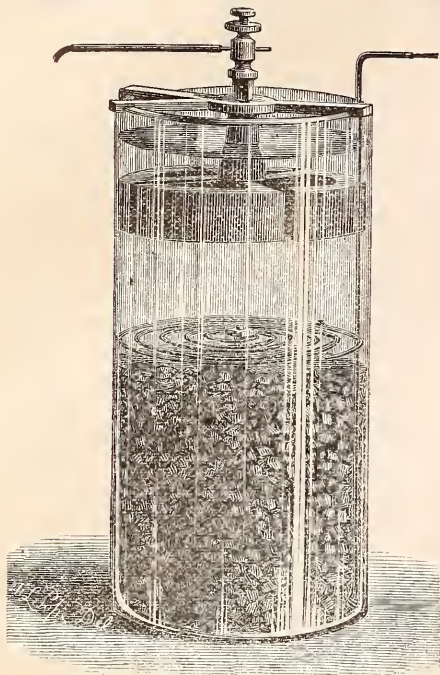
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

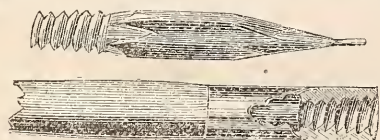
L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
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ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

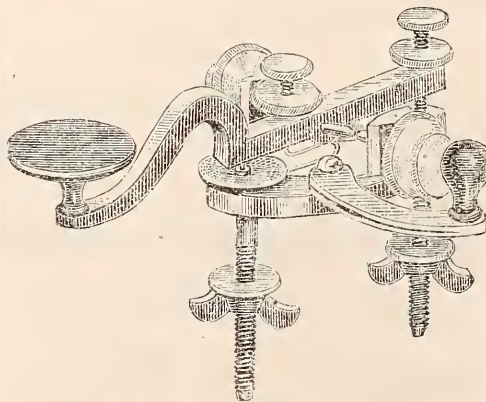
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MANUFACTURERS OF
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Material of Every Description,
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Nickel Plated Goods a Specialty.

A VERY SUPERIOR MAIN LINE SOUNDER,
ENTIRELY NEW.

SOLE MANUFACTURERS OF THE
PATENT CIRCUIT-CLOSER KEY,

Which has met with marked success.



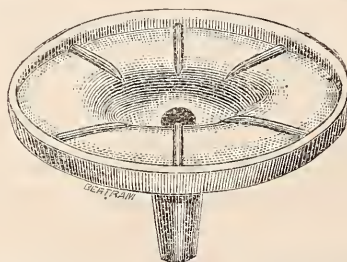
Price, \$5.50 plain; \$7 nickel plated.

The following is from a competent judge, written after some weeks' trial.

154 BROADWAY, NEW YORK, }
Sept. 22d, 1873.

DEAR SIR—Your circuit-closing attachment on the key, left with me for trial, is pronounced by all who have used it a decided and much needed improvement on the common form.

Respectfully,
A. S. BROWN, Manager.



The Best Form of Battery Insulator Offered.

SIMPLE AND PERFECT.

Made of porcelain, handsome in appearance. Occupies little more space than the cell it supports. Each cell of battery completely isolated. Leakage is reduced to the minimum by the use of it.

General Superintendent Van Horn, Southern Division W. U. Tel. Co., writes of it:

"We have now in use a thousand or fifteen hundred of your battery insulators, and expect to order many more before the close of the year.

We have never used any battery insulator that equals it in any respect. In fact, it appears to be as near perfect as we can reasonably expect, in a contrivance for that purpose."

Price 40 Cents.

We offer a very excellent article of Galvanized Wire, superior to any in the market. The linemen on Baltimore and Ohio R. R. say they have never seen its equal for toughness and flexibility.

Special attention given to building. Estimates given for any amount of material for telegraph construction or extension.

SWITCHES, GALVANOMETERS, RESISTANCE COILS, &c., to order.
Designs for Switch Boards for special service furnished.

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THE BEST TELEGRAPH MATERIAL
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L. G. TILLOTSON & CO.,
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MANUFACTURERS, DEALERS and IMPORTERS
OF
TELEGRAPH MACHINERY, SUPPLIES
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Line Equipment of every Description

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Registers.....	\$38 00 to \$45 00
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Galvanometers, \$7 00 upward.	

RATTLER TELEGRAPH SOUNDER, \$3.50.

POCKET INSTRUMENTS, Nickel Plated, in Hard Rubber Cases, 1 1/2x2 1/2 inches.

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JONES' PATENT LOCK SWITCHES, the best and cheapest in use, with or without Lightning Arresters.

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LIGHTNING ARRESTERS for any number of wires, of most approved patterns.

ELECTRO-MAGNETS, PERMANENT MAGNETS, APPARATUS for STUDENTS and AMATEUR TELEGRAPHERS, ELECTRIC MOTORS, PRINTING and DIAL INSTRUMENTS.

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RHUMKORFF COILS, from 1/4 to 10 inch spark.

GEISSLER'S TUBES, from \$1.00 upwards
ELECTRICAL CALL AND ALARM BELLS in great variety, from \$6.50 upward.

INSTRUMENTS furnished Nickel Plated at 20 per cent. advance on List Price.

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GUTTA-PERCHA COVERED WIRES, all sizes.

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MAGNET WIRES, in Silk and Cotton, at Factory prices.
INSULATED WIRES for special purposes made to order.

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PATENT MESSAGE HOOKS, the best ever introduced, prices 65c. and 75c. per dozen.

MANIFOLD PAPER and AGATE STYLUS at bottom prices.

CABLES AND SUBMARINE WIRES, REPAIRERS' TOOLS and TOOL BAGS.

GLASS AND RUBBER WINDOW TUBES.

KENOSHA AND OTHER INSULATORS OF EVERY DESCRIPTION.

BRACKETS, PINS AND SPIKES.

HILL, CALLAUD, GROVE, BUNSEN, CARBON, DANIELLS, LECLANCHÉ, NITRO-CHROMIC AND OTHER STYLES OF BATTERY IN ANY QUANTITIES.

PURE CHEMICALS AT LOWEST PRICES.
SULPHATE OF COPPER A SPECIALTY, AND PRICES VERY LOW.

CARBON PLATES made to order for Grenil, Smee, Stohrer and other Batteries.

OFFICE FIXTURES AND BATTERY UTENSILS OF EVERY DESCRIPTION.

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The Telegrapher

A Journal of Electrical Progress.

Vol. X. New York, Saturday, March 7, 1874. Whole No. 399

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MANUFACTURER OF
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OF ALL KINDS,
GALVANIC BATTERIES,
JONES' PATENT LOCK SWITCH,
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All kinds of Electrical Instruments
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All orders promptly filled, at reasonable prices.
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WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
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CHARLES WILLIAMS, JR.,
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109 Court Street, Boston,
has for sale the various kinds of Office and Magnet Wires, including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and
DAY'S KERITE COVERED WIRE.

EUGENE F. PHILLIPS,
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PATENT INSULATED TELEGRAPH WIRES,
(PATENTED, NOVEMBER 18TH, 1873.)
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Having recently enlarged our factory, we are now prepared to furnish at short notice any style and quantity of
BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.
Sample Card and Price List furnished when requested.

Phillips' Wire can be had of
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THOMAS HALL..... "
GEORGE H. BLISS & Co. Chicago.
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AMERICAN DISTRICT TELEGRAPH Co.,
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E. F. PHILLIPS, Esq.
Dear Sir: Your office wire is a decided success. We have used it exclusively for two years and consider it the best in the market.
Respectfully,
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We warrant all Wire to be of the highest conductivity, tested by our Galvanometer, which compares with the tests of the highest authority in this country.

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TELEGRAPH INSTRUMENT.

(PATENTED JUNE 24, 1873.)
This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.
Price, complete, Sounder and Key mounted on finely finished Mahogany Base, with one Cell Hill's Patent Battery, with Chemicals, eight feet of Office Wire, and "Smith's Manual of Telegraphy"..... \$7 50
Two sets..... 14 50
Price of Sounder and Key only..... 6 50
" " " with Cut Out and Lightning Arrester attached..... 7 50
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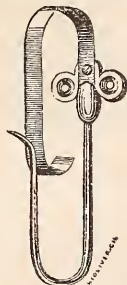
A SOUNDER FOR 30 CENTS.
THE "SNAPPER,"
a Mechanical Sounder and Key combined—giving a remarkably sharp and clear sound—weighs but half an ounce, and can be carried in the vest pocket.
EVERY OPERATOR,
EVERY AMATEUR,
EVERY STUDENT
wants one. Sent post paid on receipt of THIRTY CENTS,
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in the Roll and Sheet.
We make the manufacture of Electric Wire a specialty—especially the finer sizes of Copper for conduction, and German Silver for resistance purposes—guaranteeing the conductivity of the same in every instance to be superior to that of any other manufacturer in the market.
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Late Assistant Examiner of Electrical and Telegraphic Apparatus,
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SECURITY MESSAGE HOOK.



PATENT APPLIED FOR.
The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.
Price..... 30 cents each.
" per dozen.....\$3.00.
Liberal terms to the trade.

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SECOND-HAND RELAYS.

A large lot of well polished and good working Relays for sale very cheap; also, several sets of
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GRAPHY.
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ENGINEER TO THE
ELECTRIC AND INTERNATIONAL
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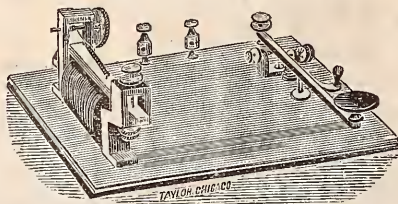
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(Patented April 16th, 1872.)



This is a *bona fide* Telegraph Instrument, with a full sized Trunnion Lever Key, with Friction Circuit Closer and a Pony Sounder, both on same base.

The Battery used is HILL'S Patent Gravity Battery, the most constant and economical in use.

With each Instrument is furnished

ONE CUP OF BATTERY,
TWO YARDS OFFICE WIRE,
ONE PACKAGE BLUE VITRIOL,
ONE PACKAGE SULPHATE ZINC,
and a "Manual of the Telegraph," for the instruction of beginners. This is a sufficient outfit for the student.

In operating a short line there will only be required, in addition to the above, more cups of battery, according to the length of line.

COMPLETE OUTFIT, WITH BATTERY, CHEMICALS
AND MANUAL,
Seven Dollars.

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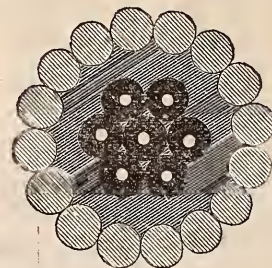
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, - - - - - PUBLISHER.

SATURDAY, MARCH 7, 1874.

VOL. X. WHOLE No. 399.

[From *The Telegraphic Journal.*]

The Historical Department of the German Telegraph Exhibition at Vienna in 1873.*

THE Annexé of the Gallery of the German Empire (viii. a) contains a treasure which must have a peculiar charm for any one who has marked the significance of telegraphy for the various departments of public and private life; while for physicists and telegraph engineers in particular it will have an irresistible attraction, exhibiting, as it does, though in limited space, so much that is instructive. This treasure is the historical department of the German telegraph exhibition, which places before the visitor's eye the development of telegraphy in Germany, from the earliest times to the present. It is impossible to pass through this little room without a feeling of gratitude to the authorities, learned societies, and private individuals, whose ready aid has rendered this historical collection possible. And yet how much more valuable might the collection be were the original idea of the man, who, as having been the leading organizer of this exhibition, has added another to his many services in the theoretical and practical development of telegraphy to be carried out, that of an *international* telegraph exhibition! The more reasonable is the wish that the collection here made may, as much as possible, remain unbroken, and that active efforts may be made to fill up any deficiencies. The development of telegraphy does not cover a long space of time, and several gaps in the collection might be filled without much difficulty; after which, the whole would be invaluable as material for a future History of Telegraphy.

In the following lines we propose to give some idea of this historical collection; to explain its significance to those who may be imperfectly acquainted with the history of telegraphy; to bridge over some gaps in the early history of the science; and with some side views to objects which are, or might be shown in other parts of the great exhibition, bring down the history to the most recent times. Commencing, then, with what is earliest, we will make a few remarks on the venerable original telegraphic apparatus, which, previous to the Vienna Exhibition, had been seen by but few persons now living.

In vain were efforts made, from the middle of the last century till towards the end of it, to utilize friction electricity for telegraphing. A pretty apparatus for lecture experiments might here and there be found in use, but any further practical application seemed impossible. The end of the century brought a knowledge of galvanic electricity; and in the beginning of July, 1809, M. Samuel Thomas von Sömmering (born in 1755 at Thorn, and a member of the Munich Academy since 1805) constructed the first galvanic telegraph, in which he utilized the phenomenon first observed by Carlisle (in 1800), that the galvanic current decomposes water into its elementary constituents, oxygen and hydrogen. Sömmering covered 27 wires with silk, so as to insulate them, formed them into a rope, and brought the gold point ends of the wires, each of which represented an alphabet letter, into a glass trough filled with water; while, at the other end of the rope, two of the wires could be connected with the poles of a voltaic battery; whereupon gas bubbles began to rise in the trough, at the two wire ends—oxygen at one, and hydrogen, in greater quantity, at the other. Sömmering thus always telegraphed two letters at once, the letter of the hydrogen wire being regarded as the first. To announce the commencement of the process an alarm was added, and it appears in the apparatus belonging to the Sömmering family here exhibited.

The possibility of telegraphing with such apparatus is undoubted; and, as afterwards improved by Schweigger, who reduced the number of wires to two, the telegraph would have been practically available; but as the demand for good telegraph quickly increased, better means were found of satisfying it. So that the Sömmering telegraph had as little practical development as the proposal made by Prof. Coxe, of Philadelphia, in 1810, to utilize the decomposing action of the galvanic current on various salts for telegraphic signaling.

The development of telegraphy took a new direction when Prof. Oersted, of Copenhagen, in the end of 1819, made the observation that an electric current deflects a magnetic needle, when passing near it, out of its normal direction north and south. Already, in 1820, the French Academician Ampère proposed to employ the deflection of (30) magnetic needles (with 60 conducting wires) in telegraphing; but, owing to the number of wires required, the proposal, like some later ones, dropped. Next, in 1832, the Russian Councillor Schilling, of Canstadt (of German descent), sketched a telegraph with only five needles; later, he used only one. A drawing of his apparatus, preserved by the St. Petersburg Academy of Sciences, is exhibited. Schilling died in 1837, before his telegraph was fully completed. In 1836, however, William Fothergill Cooke saw one of Schilling's telegraphs in Heidelberg, and was induced to apply himself to the construction of telegraphs.

A telegraph on a larger scale was constructed, in 1833, by Profs. Gauss and Weber, in Göttingen, and it continued in use till 1838. At first galvanic currents were used; later, magneto-induction currents. The exhibited telegraph is the property of the Physical Laboratory in Göttingen. The needle in the receiver is a large magnetic bar, 1.21 metres long, 0.075 broad, and 0.015 thick; and the surrounding multiplier coil is enclosed by a bobbin of strong copper wire, with few turns, which acts as deadener. The needle's oscillations are shared by a small mirror, which is observed through a telescope. The sending instrument includes an induction coil enclosing a strong magnetic bar, and, by one or other of two levers, this can be moved over the bar; the connecting piece of the two levers is capable of turning about a horizontal axis, and forms part of a mercury commutator, which sends the current sometimes in the one, sometimes in the other direction, through the multiplier coil, and deflects the needle within it to the left or to the right.

The next progress in construction of needle telegraphs, viz., their transformation into writing or printing telegraphs, we owe to Prof. Steinheil, of Munich. He constructed the line (three quarters of a mile in length) from Munich to the Bogenhausen Observatory, and telegraphed, in July, 1837 (to the latter), with the apparatus exhibited, which includes, as transmitting instrument, a magnetic inductor, capable of turning about a vertical axis, and a mercury commutator, and, as a receiving instrument, two small steel magnets turning about a vertical axis within a multiplier bobbin traversed by the induction current. Each of these magnets is furnished at one end with a small vessel of coloring matter, at the other with a metallic tongue; and they are so arranged that a current in one direction causes one of them to press with the ink vessel against a strip of paper carried along in front of it, a current in the opposite direction the other, or makes the tongues of the magnets strike on two different toned bells. The Steinheil telegraphic writing consisted of points in two different lines, these points being so grouped as to denote letters and figures. An essential advantage in the use of such writing, especially for deep sea telegraphy, lies in the fact that, for producing it, merely currents of equal length can be used. A further service was wrought by Steinheil, in 1838, in discovering the possibility of return conduction of the electric current through the earth; thenceforth only one line was required for each telegraph.

In England, Cooke, who, after his return from Germany, in 1836, had made a needle telegraph with 3 needles and 6 wires, and a pointer telegraph, united with Professor Wheatstone, and they took out a patent for a telegraph with 5 needles and 5 or 6 wires. On the 25th of July, 1837, the first trial experiments were made with it on the North Western Railway in London. In 1840 they furnished 39 miles of the Great Western Railway with their lines; but on account of its great costliness (£250 to £300 per mile), the telegraph was not further extended. The needle telegraphs, constructed by Cooke and Wheatstone, with 1 and 2 needles, have continued in use up to the present. Though these telegraphs do not give an enduring signal, they yet commend themselves for many purposes, on account of their simplicity and convenient handling. Siemens's double needle telegraph (with electro-magnet) of the year 1849, is exhibited in the historical department; and one of the most recent double needle telegraphs of Siemens Brothers in London, is to be found in the English department of the exhibition.

The first pointer telegraph, in which the letter to be telegraphed is indicated by a pointer, which moves over a lettered disc, stopping opposite it, was constructed by Cooke, in 1836; and in 1840 Wheatstone greatly improved this system of telegraphy. Among the German pointer telegraphs exhibited, the latest is that made by Leonhard, in Berlin, in 1845; in the receiver of which, the electric current, by means of an escapement, sets the scape wheel (on the pointer axis) in step by step rotation, while the closing and interruption of the current in the receiver is done with the aid of clockwork. The telegraph of Drescher, in Cassel

(not exhibited), had a similar arrangement. Essentially different is the pointer telegraph patented in Prussia, in 1846, by Siemens, of Berlin. This telegraph works with automatic interruption of the current, and the pointer is caused by rapidly successive making and breaking of the current to pass on to the letter to be telegraphed. This telegraph is, at the same time, the oldest exhibited printing telegraph; for it has a peculiar arrangement for printing the telegraphed letter on a strip of paper. The first type printing telegraphs were, indeed, previously constructed, in 1837, by Vail, in North America, and Wheatstone in England; also, in Germany, in 1844, the type printing telegraph transformed out of a pointer telegraph by Fardely came into use on the Taunus Railway. Of the older pointer telegraphs the historical collection only contains the pendulum which served Dr. Kramer, of Nordhausen, as relay, but unfortunately the rest of the apparatus is wanting. Copying telegraphs there are none in the historical department, but in the French Telegraphic Department may be seen two recent copying telegraphs, those of Meyer and of Gyt d'Arincourt.

To about the same time as the needle and pointer telegraphs reach back also those of the Morse system. Prof. Morse (who died in 1872) has told us that it was in October, 1832, on his return voyage to America, the idea occurred to him of making electricity give durable and audible signals at a distance; and he also then sketched out an electro-magnetic telegraph, and a telegraphic dictionary for the signals, which were formed of dots. It was in November, 1835, he showed his friends in New York a model, differing essentially from the later Morse apparatus, and in which a zig-zag line was drawn by a pencil on a strip of paper passing before it.

The Morse writing now used consists of groups of dots and dashes, either embossed with a style, or written with colour. The electro-chemical writing, through decomposition of metallic salts in strips of paper impregnated with them, has, notwithstanding many years' experiments by Morse, Davey, Bain and others not come extensively into use; in the present collection are shown Gintl's chemical telegraph, and the double style apparatus of Stöhrer.

The oldest apparatus for embossed writing exhibited is Siemens's style or relief writer, dating from 1849, and so from the earliest time of introduction of the Morse telegraphs into Germany. The electro-magnet stands upright, and the lever of the armature has an arm directed downwards to which the separating spring is attached. The next oldest style writer was made by Siemens, in 1853, and came into use on the Russian lines. The lever is here connected with one core of the electro-magnet, and this core, oscillating about a horizontal axis, is prolonged, in shoe form, to the other core; thus the working of the electro-magnet is rendered quicker than that of ordinary electro-magnets. The same arrangement is seen in the electro-magnet of Frischen's style writer, 1856, for closed circuit (*Ruhestrom*). In the relief writer of Lewert, of Berlin (1865), the spring barrel of the driving gear is removable, and the driving gear itself is fitted in a case, at the side of which passes the paper strip.

There is a greater variety in the construction of ink writers (black or blue). The first of these was made by Thomas John, of Prague, in 1854. In the original here exhibited, the writing wheel (fed with coloring matter from a saturated roll of felt) is fitted to a spring lever, which shares the movements of the armature lever of the electro-magnet, being connected with it by a small bar. The writing wheel is set in rotation by a cord passing from the cylinder of the paper strip. There is further exhibited a polarized ink writer, in the apparatus for submarine lines which Siemens constructed, in 1857, for the Red Sea cable; also the first construction of polarized ink writer (patented in England in 1862), in which a small writing wheel, fitted to a slowly rotating axis with universal joint, and pressed by a lever against the paper strip, dips in an ink-holder, the level of which may be altered. The ink writer of Lewert, of Berlin (1865), with removable spring barrel, has the arrangement preferred by Digner, in Paris; the writing wheel is fixedly fitted to the stand, and is slowly turned by the ink roller, which is in contact with it, while the knife edge extremity of the writing lever presses the paper strip against the wheel whenever the armature is attracted. Lewert, however, has added above the ink roller, an ink holder with valve. The other ink writer of Lewert (1868) is furnished with automatic ratchet wheel, and (as also one exhibited by Moller, of Cologne) has Brabender's arrangement of lever (1868) which is suitable either for the working current or the closed circuit system. The older arrangements of the kind by Wiehl and Dehm's one misses in the historical department; the most recent have been exhibited by M. Schäffer, in Vienna, in the Pavilium of Commerce and Palace of Industry. The polarized quick ink writer of Siemens (1868), lastly, is characterized by an arrangement which permits of varying, within wide limits, the rate of paying out the strip of paper. The department does not contain any ink writer of the kind devised by

*Abstract of a paper by Dr. Zetzche in the *Internationale Ausstellungs-Zeitung*.

G. Wernicke, in Berlin, in which the ink passes through a capillary tube to the paper from a holder fixed to the lever, unless we here reckon the ink writer exhibited by the Bavarian telegraph authorities, in which the paper strip is moved by the lever against a fine orifice at the lower end of the ink holder. Another Bavarian ink writer, again, with knife edge on armature lever, presents a new mode of transmitting rotatory motion to the little wheel. We may here refer to the peculiar ink holders, serving at the same time as writing wheels, that are exhibited in the French department.

There have not been wanting, also, experiments to group dashes and dots distributed in two lines according to a telegraphic code. The electro-magnetic double style apparatus devised by Stöhrer, of Leipsic, came into use in Saxony, in Bavaria (1849-58), and experiment-wise, in Austria, but, notwithstanding its simple and short writing, had to give way to the Morse apparatus. The department exhibits one of Stöhrer's double style apparatus of the oldest construction (with polarized relay belonging to it), and there is another quite similar in the Bavarian department; also, in the latter, a new double style writer, with four different relays (with movable plates, with two constant steel magnets, with two horse shoe magnets, with six bar magnets); in the general department, on the other hand, we find Siemens's alterations—a double style relief writer (1850) with the oldest form of polarized relay (without steel magnets); the armature magnetized inductively from the core of an electro-magnet, with branch current from local battery circulating round it, and a key board with 30 keys, as also a polarized double style relay with steel magnets (1852).

It has lately been proposed (1872) to return to the Steuheil writing, which consists only of dots distributed in two lines, but with this difference, that with a suitable punching arrangement the points be punched in the paper. Apparatus of this kind are exhibited by Jaite and Gurl, of Berlin.

There are no copying telegraphs in the German exhibitions, for no German has made such a telegraph.

Of type printing telegraphs, the historical department contains, besides that of Siemens's already referred to, only Hughes's apparatus as made in Germany, and an insertion for Hughes's end and translation stations; the French exhibition, on the other hand, shows the type printing telegraphs of d'Arlincourt and Dujardin, of Lille, each of which is fitted with two type wheels. The newest type-printing telegraph, that of Siemens, only arrived in Vienna about the middle of August. The Börsen telegraphs, finally, of O. Schäffler and A. Bauer (in the Austrian department of the Palace of Industry) are also type printing telegraphs, but they require two or three lines.

Alarm apparatus for railways is only represented, unfortunately, by one of the oldest, that of Siemens's (1847), in which a hammer is raised and falls back of itself. The importance of bell apparatus for railways appears in other parts of the exhibition.

Of the efforts which have been made to utilize the same telegraph line for the simultaneous transmission of several telegrams (duplex telegraphy), we are reminded, in the historical department, only by Frischen and Siemens's relay with double coils, and oscillating magnet, for duplex signalling (patented in Prussia in 1834), and a relay with double coils by Borggreve. In this respect, therefore, the collection is very deficient; for most of the proposals in this direction have been made by Germans. It is also to be regretted that the recent successful experiment in duplex telegraphy by Preece in England has not been exhibited, and that of telegraph apparatus in England, generally only those of Siemens Brothers are shown. From Hungary we have the duplex system of Franz Kosmata, in Pesth (1869). And we may here lastly notice the method (closely related to double telegraphy proper), first brought out in 1851, in which, on one and the same line several telegrams are transmitted alternately in fragments (that is, the signals of the two telegrams alternating). The most suitable of apparatus for this purpose is that recently constructed by B. Meyer, in Paris, which was practically tested from 18th July to the 10th August, on a half-mile line from the Palace of Industry (French department) to the central telegraph office, and with good results, which allow of the hope that it may be practically serviceable on longer lines. Another experiment towards solution of the same problem was made by A. Bauer, in Vienna, whose apparatus (*Illimit Apparat*), not quite completed, unfortunately, and by no means simple or readily intelligible, appears in the Pavilion of Commerce. Both apparatus require, of course, synchronism between the two stations.

The total traffic receipts of the Great Northern Telegraph Company, have been, during January, 1874, 332,471 francs, and in the corresponding period of 1873, 150,847 francs. On the European lines, in 1874, 166,040 francs; in 1873, 121,377 francs. On the China and Japan lines, in 1874, 156,431 francs; in 1873, 38,470 francs.

Appropriate Presentation to Superintendent W. A. Graves, of the N. Y. C. and H. R. R. Telegraph.

THE telegraphers connected with the line of the New York Central and Hudson River Railroad Telegraph have presented to their chief, Mr. W. A. Graves, a magnificent frame, containing photographs of all the present and former operators on the line under his charge. The testimony is an appropriate and valuable one, and is most worthily bestowed, and is highly prized by Mr. Graves as an indication of the warm personal friendship of the telegraph employes under his charge.

The following is the correspondence exchanged upon the occasion:

"ALBANY, N. Y., Feb. 18, 1874.

W. A. GRAVES, Esq.

Dear Sir—The undersigned telegraphers desire you to accept the accompanying picture as a slight testimonial of their respect and regard; hoping the receipt of the same may afford you as much pleasure as its presentation does us, and that the friendship and good will now existing may continue long after our business relations shall have been severed.

We remain, respectfully and truly yours,

J. H. Covert, W. H. Whyland, O. E. Stafford, J. Wetterau, Jr., R. Davis, J. Q. Wires, W. S. Dunbergh, J. Pembroke, G. H. Cooke, H. W. Denuington, A. Seely, L. Wadsworth, J. H. Eylebergh, W. S. Paddock, A. E. Clark, A. Marvin, J. F. Trenchard, J. J. Fitzgerald, W. E. Feno, W. J. Warren, C. V. Parker, F. Gould, Geo. Woodworth, Ira S. Kiuch."

"ALBANY, N. Y., Feb. 19, 1874.

GENTLEMEN—I should wrong both you and myself if I failed to express my pleasure and very agreeable surprise in being the recipient of your very beautiful and valuable present. I thank you for it, containing as it does that which will always remind me of those with whom I have worked and grown up.

I cannot, however, prevent myself from saying that I have always felt a delicacy in accepting any testimonial from my associates during the existence of such relations as you and I occupy. We are servants of an institution that demands from us in common severe labor and rigid discipline, and should do nothing that would have a tendency to weaken or embarrass those relations. I know you will all agree with me in this respect, and while I earnestly desire your comfort and success, I also do not forget the inexorable duty we owe the company in whose employ we are.

You will not misunderstand me; regard me as your friend; command me when I can aid you; and know that I shall always be pleased to see each and all of you prosper and succeed in life; and prosperity is certain if you are faithful in every duty you undertake to perform.

I do not feel ashamed of the condition of the division on which we are located, and know it will compare favorably with any other circuit of this or any other company's telegraph department. I often feel proud when I think over the improvement plainly visible since I first came on the line, and thank you, each and all, for it; without your aid and coöperation no success could be reached in this direction. I only request the same cheerful compliance in future as you have shown in the past, which, I assure you, has been and will be appreciated. To those represented, who have left our circuit, I can only say, thanks; their faces take me back to the past, and I can say only I am glad to be remembered by them, even though our business relations of intimacy are broken.

Again assuring you of my hearty thanks for your very kind present and the delicate way it has come to me, I am yours truly,

W. A. GRAVES.

To Messrs. Covert, Whyland, Kiuch, Woodworth, and all others represented.

P. S.—The picture hangs in my home in Schenectady, where I shall be pleased to see you, one and all, at any time. W. A. G."

The Panama Cable Service.

THE West India Cable Service continues to be a source of great annoyance to business men on the Isthmus and the Coast who used to use it. We have complaints by last mail from Lima of two messages sent to a firm in London that have never been delivered, and innumerable growls are constantly being made of prolonged delay in transmission, so much as to render a message of no value. In reply, we may say that the cable service between Santiago de Cuba and Havana is still carried on by steamer, the voyage occupying three to four days, for which a heavy extra charge is made. A message from Panama to New York or London may get through in six or seven days, and may take twelve to fifteen. Those interested must therefore use their judgment as to whether mail or cable is the quickest, most reliable, and most profitable to patronize.—*Panama Star and Herald*.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., March 4.

TO THE EDITOR OF THE TELEGRAPHER.

THERE has been such an entire lack of interest in telegraphic matters here that material has been wanting for my communications for some weeks, and, therefore, I have not troubled you. There is even now but little to be said that will be likely to interest your readers.

The Senate Post-office Committee have continued to tinker at the Hubbard bill at intervals. It is understood now that the bill is practically completed, and it has been published in the shape in which it will probably be reported sometime during the present session. As there is no material alteration in the bill, and as it has not the slightest prospect of success, it is not necessary to burden the columns of THE TELEGRAPHER with a synopsis of it. It is the same old bill, and, no doubt, in deference to Senator Ramsey, its chairman, who is its Senatorial champion, the committee will report the bill as often as may be desired.

The following, from the *Chronicle* newspaper of this city, states the actual condition of the postal telegraph matter succinctly and correctly:

"The recommendations of the Postmaster General for adopting a system of postal telegraphy have not been presented to either House of Congress in the shape of a bill. Advocates of a project like that proposed by the Postmaster General have not been found in Congress since the retirement of E. B. and C. C. Washburn. There appears to be a lack of enthusiasm in Congressional circles upon the subject, and it will not likely be agitated this session. The Postmaster General feels content at being put on record as an advocate of postal telegraphy, and beyond this he will make no further effort in behalf of the plan. In the meantime the Senate Committee on Post-offices and Post Roads are tinkering away at the Hubbard bill, and it will probably come before the Senate in some shape shortly; but there is not the least chance of its success, as the disposition of Congress is to avoid the consideration of such an important question at this time, and there are but few who would give it the attention it demands."

As the *Chronicle* is a strong advocate of the postal telegraph scheme of the Postmaster General, this statement is the more noticeable.

The invention of Mr. W. E. Sawyer, for increasing the speed of transmission of signals over cable telegraph lines, has attracted considerable attention, and it is understood that Mr. Sawyer is constantly in the receipt of letters inquiring about it. The following is Mr. Sawyer's description of his invention, contained in a statement which was referred to the Committee on Foreign Affairs of the House of Representatives, before whom the application for a charter for a corporation to lay and operate telegraph cables on this system is pending. It is printed in Miscellaneous Document No. 115.

"The endeavor of the inventor of the methods which form a portion of the present subject, was to reduce the four impulses now requisite to transmit a letter to a single impulse. It was believed at first, and experiment has proved the correctness of the assumption, that eight different kinds of signals could be obtained from the mirror-galvanometer instead of but two, viz., a slight and a more marked movement of the mirror to the right and left; or four, and the same movement in connection with a quick return to the initial points, by means of the introduction of the opposite currents, or four more.

The next idea was to transfer to a synchronously revolving local cylinder, through the human intelligence, the impulse manifested by the mirror, thus obtaining any desired electro-magnetic power without static or retarding effects. The transmitting instruments consist of a cylinder revolved in synchronism, and a duplex lettered key board, namely: 26 keys, representing the 26 letters of the alphabet, and 26 secondary keys, representing the same letters with a letter or two letters in combination, thus: primary key A, secondary key A T; primary I, secondary I N G. The primary keys introduce upon the cable the simple positive and negative currents; the secondary keys introduce combination currents, as negative-positive, and positive-negative, to form the combined mirror movements above noted. The receiving instruments consist of the mirror-galvanometer, a quadrisectional cylinder revolving in synchronism, two combination local circuit keys, and a printing apparatus. Now, if we were to have in England a cylinder containing connecting points, and a key board representing the alphabet, and in America a type wheel revolving in synchronism with the cylinder in England, both in-

struments being in adjustment, and if the operator in England were to depress a key representing, we will say the letter A, when the proper point on the cylinder in England should come round it would make a connection with the depressed key, and, electrifying the cable, would occasion a movement of the mirror in America; and if the moment the operator in America should perceive the mirror move he should depress a local key and form a local circuit, which should stop the type-wheel, and perform the function of printing, the letter A would obviously be printed in America. This is the operation of the printing telegraph in use on land lines, with the exception that the electrical impulse is communicated directly to the type wheel; instead of through the depression, by the receiving operator, of a local circuit key to transfer it to the type wheel. The type wheel, however, could be divided into twenty-six sections, each containing a letter, and to attain a high rate of speed it would have to be revolved as many as 250 or 300 times a minute, carrying by a given point in a minute's time some 7,800 letters, which would be a rapidity too great for safety. But by using four sections of a cylinder, each the equivalent of a type wheel, because electrically connected with a printing apparatus, the alphabet is so combined, with reference to the occurrence of letters in words, merely by using four different movements of the mirror, that with but 15 letter-equivalents upon the periphery of the quadrisectional cylinder $4\frac{2}{3}$ letters are obtained at a revolution, and by combining this with the duplex and triplex letters, 9 letters are obtained for each revolution of the cylinder.

Thus, by giving the cylinder 25 revolutions per minute, which is but one tenth the rate of speed required to attain the same result in the printing telegraph used on land lines, a printed record is had of 45 words per minute, and the capacity of the cable is trebled. Two operators are required at the receiving instruments, one to operate the combination key for recording the short movements of the mirror, and the other the long movements. The apparatus for keeping the transmitting and receiving instruments in synchronism is of the simplest character, and consists, first, of the ordinary face governor clockwork at each end of the cable, which, when motion is imparted by the same weight, say 45 pounds, run nearly the same. When a message is coming, the weight at the receiving station is increased to, say 50 pounds, when the receiving clockwork, moving from a heavier weight than the transmitting clockwork, is constantly gaining upon the latter. A wheel carrying, fixed upon its periphery, crosswise and equidistant, fifteen armatures, is attached to the shaft, which carries the quadrisectional receiving cylinder. Placed so as to just escape the armatures, so as, when magnetized, to attract them in the direction contrary to that in which the cylinder is revolving, is an electro-magnet, and whenever the quadrisectional receiving cylinder has gained upon the transmitting cylinder the one twentieth part of its periphery, the same operation which performs the printing sends a current through the electro-magnet, and the cylinder is again brought into position."

CAPITOL.

Telegraphic Colleges Again.—What They are Doing, and What Practical Operators Should Do.

TO THE EDITOR OF THE TELEGRAPHER.

In a late issue of the *Journal of the Telegraph*, an editorial appears in which telegraphic colleges are strongly recommended as proper places for young men and women to learn the art.

Can it be possible that the editor of the *Journal* is paid for such puffing? or does he write in ignorance? He should have the benefit of any doubts, and we will assume that the latter supposition is correct.

For his especial benefit it may be well to chronicle a little historic event which occurred a short time since, and which, by the way, is a fair illustration of frequent occurrences of like nature in all our large cities.

After reading the following, if the editor of the *Journal* can, consistently with his ideas of honesty, truth, and justice, recommend these swindling institutions, let him do so; but we will have the satisfaction of knowing that he does not do it in ignorance.

At stated intervals, for many years, a manager of one of our large city offices has been annoyed by the proprietors of a commercial college making applications for situations in behalf of their graduating dupes.

The students themselves also make personal applications, with flowery diplomas in their pockets, certifying that they are *first class operators*, capable of receiving *twenty-five* or *thirty* words per minute, making good copy, etc.

The manager, a true gentleman, knowing the shallowness of their telegraphic knowledge, usually returns a civil answer, that "the company are not just now in want of any operators."

The poor victims approach with an air of great confidence, having been told that first class positions could

be obtained only for the asking; but they go out a little wiser and a little less confident.

Not long since, a poor, hard working German came in with his daughter, a girl some fourteen or fifteen years of age, who was a graduate of the telegraphic department of the commercial college, had a splendid diploma, stating that she was capable of receiving thirty words per minute. The manager having learned from one of the professors that this girl was the "distinguished scholar" of the department, concluded to give her a fair trial.

Escorting her to the operating room, he switched a way wire upon an instrument the most remote from the clatter of the other machines, and asked her if she could read the writing.

"Oh, yes; I read it all," she replied.

Messages were passing at the rate of twelve or fifteen words per minute, when the manager, giving the young lady a pencil, seated her at the desk, requesting that she copy the messages as they passed. He then very considerably stepped away from the desk, that she might not be confused by overlooking eyes.

She appeared very self-possessed; and as she sat down and commenced writing a distant observer was confident she was acquitting herself creditably. At the end of a minute or two the business on the wire was suspended, and the manager requested the operator seated at the regular instrument of the wire, to write something. About thirty words were then manipulated slowly and plainly, on an average of about fifteen words per minute.

The manager then signified that this was sufficient, and taking the copy which was on a number one blank examined it carefully. He then politely escorted the maiden to her father, who had remained in waiting, and told them that he had all the operators he wished at present. Out of regard to the feelings of the poor man and his victimized daughter the truth was not spoken, and they departed in ignorance of the great imposition by which they were the sufferers.

The beautiful copy at the rate of thirty words per minute was passed around for inspection, when lo, behold! there was not *one* intelligible word written upon the blank. Out of about one hundred words which the young lady had endeavored to copy, there was not *one* whole word written disconnectedly. She had caught one or two letters of one word and one or two of another, placing them down in order as they were distinguishable to her, and so on a letter or two from each word through the whole, until there appeared a conglomeration of letters—a perfect mass of unintelligible words.

A despatch written in Spanish, such as we are sometimes called upon to handle, could not be more unintelligible to the American operator than this girl's copy.

She is no more capable of working in a telegraph office as an operator than a Feejee islander, who never heard of a telegraph.

What is the meaning of the word swindle if it does not express to us the character of this diploma?

Is there not a law in the land which, if enforced, metes out justice to a person or persons obtaining money under false pretences?

This poor German had undoubtedly read the neatly worded advertisements of this commercial college, wherein they agree to fit male or female students for first class telegraphic positions in three, four or six months, and which assert that such positions can readily be obtained, etc. He had disbursed his hard earned dollars to give his daughter such an education—dollars, perhaps, which were necessary to insure his own comfort during the hard winter. He had denied himself for the time, under the delusion that the money would soon be replaced when his child would be earning a good salary.

Do the *Journal* people approve of such infamous doings as this?

A bogus medical college was broke up in Philadelphia not many months since, where, for a consideration, certificates were ground out and distributed to persons wholly incompetent to practice. The practicing physicians, who had obtained their papers by years of hard study, cried out against the swindle, and brought the law in its majesty upon it. Precisely the same thing is being enacted right under our noses, and the telegraph operators of the country rise not in their own defence.

AGITATOR.

Obligations of Telegraph Companies and their Employes.

PITTSYLVANIA C. H., VA., Feb. 26.

TO THE EDITOR OF THE TELEGRAPHER.

A MESSAGE was received at this office, signed "A Friend," to a young man in this place, warning him of a certain danger impending over him. The young man naturally was alarmed, and immediately started in the night, through a storm of hail and snow, travelling a distance of 25 miles on horseback, in consequence of receiving the message. He found, on his arrival, that the information was false, and on his return the next

day that the warning message was sent by *some friend* as a *hoax*. The young man then sends a message to the operator at the office from which the message was sent, demanding the real name of the person from whom the message originated, but the operator refused to give him the desired information without the consent of the party sending the despatch.

Under these circumstances can the operator be compelled to give the name of the author of the despatch, if he knows it; and are telegraph companies liable for damages for transmitting such messages? By answering this in your next issue you will greatly oblige me.

Q.

ANSWER.—Telegraph companies and their employes are bound to use ordinary care and diligence that their facilities shall not be employed for fraudulent or illegal purposes. They have no right to transmit anonymous messages of the character referred to, and there can be no doubt but that they are under legal obligation to give the desired information, if in their possession, or are responsible in damages for knowingly permitting such improper and fraudulent use of the wires.—EDITOR OF THE TELEGRAPHER.

The Franklin Line Telegrapher at the Capital.

WASHINGTON, D. C., Feb. 22.

TO THE EDITOR OF THE TELEGRAPHER

THE 22d of February, and the lines down North! Ought not this to be a good time to write up for your journal, and contribute our mite to unite all operators in closer bonds of friendship?

I think we have as many characters and as many "boys" in this office as any other south of New York. First, our manager, "K. D.," is a study. If you especially wish to see or speak to him you will find he is in Baltimore, for, as he is manager both here and at Baltimore, he spends about a fourth of his time "on the wing." If we could only send him by telegraph he would be the happiest man in the world.

Next come our two chief operators, "X" and "Da," who are just the opposite in everything. "Da" has the hot French blood flowing through his veins, and is fiery and quick tempered, but very polite and excessively careful about his "rig." If his imperial was not twisted to the fineness of a needle, and his shirt bosom spotless white, he would die of misery. He is a great man at the Capitol office, especially among the ladies, and is by far the finest looking man in the office. He was married a short time ago, and favored us by bringing around his wife, that we might see what kind of an eye he had for beauty.

"X" is going to make a fine man, if he does not hurt himself by over work. It does me good to see him rush in the office when everything is in a jumble, and knock things right and left. I would not like to receive from him as a steady thing, for he never catches hold of a key without making it rattle and spin. He timed himself and ran up to fifty-one words a minute, which we all felt proud of, and if any W. U. man wants to beat it, just let him come round and try it. "X" is the friend of every student and "plug" on the lines, as he is not so small and mean as to be afraid of competition, and is too much of a gentleman to ever lord it over any one beneath him.

It is whispered that "X" is engaged, but I suppose it is only the wind whistling around the corner. If it is so, I would advise her to most positively insist, for his good as well as her own, that he should never work twenty hours in one day—as he did not long since.

About the queerest character about the office is "Ga." He always comes down with a great lounge cloak, which reaches nearly to his feet, and which he wears in the true Greek style. As soon as he opens the door there is always a breeze among the operators. Always lively and as quick as lightning at repartee, and will never lose a joke whether it is against himself or not. Although he is a great student, I am afraid he has not much genius for writing with lightning.

A VOICE FROM THE CAPITAL.

An Imperial Telegraph Operator.

BUFFALO, Feb. 25.

TO THE EDITOR OF THE TELEGRAPHER.

The following is from an article printed in the *Berlin National Gazette* respecting the daily life and habits of the Emperor Joseph of Austria. Many of your readers will no doubt be gratified to learn that our royal brother is a first class sound operator:

"He next hastens back to his cabinet, and those who could watch him there would undoubtedly be greatly interested. There is a telegraph instrument in the cabinet, and the emperor, who is a remarkably good operator, having learned this as his trade, listens with close attention to the clicking of the wires, and sends every now and then a telegram himself—this being his favorite mode of corresponding with his personal friends and favorites."

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, MARCH 7, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

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A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

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TENTH VOLUME.

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J. N. ASHLEY, Publisher,

(P. O. Box 5503,) NEW YORK.

Telegraphic Projects at Home and Abroad.

THE sudden withdrawal of the scheme for a light
cable between England and Halifax, Nova Scotia via
the Azores Islands, which was recently announced
with quite a flourish as to what was to be accomplished
by the laying of a cable which could be manufactured
and put down at a comparatively small cost, and a pro-
posed reduction of charges for cable service to one
shilling per word, naturally suggests the consideration
of telegraphic projects which are proposed at home
and in foreign countries. We are not surprised at the
withdrawal of this scheme, though it has come some-
what more speedily than was anticipated. The alleged
cause is the lack of countenance and pecuniary support
which it has met with. The real cause we think is of
a different character, and that the scheme actually
received fully as much countenance and encourage-
ment as its projectors anticipated. In fact we do not
believe that, on the part of those who undertook to
engineer the proposed company, there was ever any ex-
pectation or intention of laying the cable.

The reasons for the belief, we think, are convincing.
For some time previous to bringing out the prospectus
it was very generally given out that such a company
was to be inaugurated, and that a cheap cable was to
be laid at so small a cost as to enable the service to
be performed at a fraction of the rate charged by the
Anglo-American Company, and that the effect would
be exceedingly damaging to the interests of that com-
pany, who had such an amount of capital invested in
their cables as to render it impossible to work them
profitably at anything near the rates on which the new
company could live and make money. The effect of
these disquieting reports was to materially depress the
market value of the shares of the Anglo-American
Company, notwithstanding that company was doing a
better and more profitable business than ever before.
This suited admirably the speculators who were thus
enabled to purchase more cheaply the shares of the
company which timid holders threw upon the market,
in anticipation of the time when the cheap cables
should render them valueless. The prospectus was
finally brought out a few weeks since, and we think
that at one time the shares of the new company were
nominally quoted at 1/2 per cent. premium. The desired
effect having been produced, and it being evident
that Anglo-American shares could not longer be un-
favorably affected or cheapened by a project which
there was nothing to indicate would prove practically
successful, it has been quietly dropped, and Mr.
HIGHTON and others, who honestly believe that there is
a merit and superiority in light telegraph cables, are
coolly informed that the public won't invest their
money in a scheme which has so little probability of
practical success and permanence.

Whether the Anglo-American Company has offered
any additional inducement to the manipulators of this
enterprise to remove it from the path, of course we
cannot be expected to know. It was understood, how-
ever, that it had been decided by that company that
for the future its purpose was to contest instead of
buying off competing schemes.

As has already been stated, the Anglo-American
Company have contracted with the Telegraph Con-
struction and Maintenance Company to utilize the sur-
plus cable on hand by manufacturing sufficient addi-
tional cable and putting down another cable to Heart's
Content during the coming summer. This cable is not
now needed for the business of the company, but it
has been its policy from the start, and an excellent
policy it is, too, to increase its facilities in advance
of their probable requirement. It is not improbable that
when this cable is laid that there may be a reduction
of the existing rate of charges for Atlantic telegraph
service.

The United States Direct Cable Company seems to
be progressing with its new cable, and it is confidently
anticipated that it will be laid during the coming
season. We have not, it must be confessed, had until
recently much faith in the actual laying of this cable.
We did have faith in the Great Western Telegraph

Company, which had made nearly as much progress
towards the completion of its cable and its laying as
the United States Direct Cable Company has had, when
all of a sudden the project was abandoned, and the
cable transferred to the Western and Brazilian Com-
pany. We are assured, however, by those who ought
to know, that the enterprise is undertaken in good
faith, and the cable will be laid during the coming
summer. A contract for a connection has been made
with the Atlantic and Pacific and Franklin Companies.
The line of the Franklin Company is, we understand,
to be extended to Rye Beach, N. H., where the cable
is to be landed to meet and form the connection with
it on this side. In this country there appears to be at
present a very quiet condition of telegraphic affairs,
and nothing can, as yet, be definitely stated as to
future telegraphic movements and extensions. It is
understood that the Atlantic and Pacific Company
have in view some extension and increase of its lines
and facilities during the coming season, but how
radical and extensive these may be cannot now be
stated.

It is also understood that the Automatic Telegraph
Company have nearly completed negotiations for the
extension and development of a system of lines upon
the automatic principle of telegraphy, but as yet the
public are in the dark in regard to what is to be done.

With these exceptions we do not learn of any very
important telegraphic projects in this country in the
immediate future. The general dullness of business
with which the telegraph sympathises of course has
for the time checked development in this direction, and
until there is a revival of the general business of the
country we do not look for any special or very im-
portant advance in telegraphic development.

As we stated recently, it is understood that there is
a considerable amount of foreign capital ready to be
invested in American telegraphs, whenever matters
get into such shape as to promise favorable results.
Those who control this capital, however, will not invest
it until there is a reasonable prospect that the senseless
division into separate companies of the organizations
competing with the Western Union Company shall be
abandoned, and a consolidated competing organization
take their place.

The Southern and Atlantic Company is the only one
outside of the Western Union that is at this time
actively engaged in extending its lines. The wires of
this company are being advanced towards New Orleans,
which, until they reach it, is, since the consolidation of
the Pacific and Atlantic with the Western Union lines,
without telegraphic competition. This company has
met with many obstacles and hindrances, but its lines
are steadily if not rapidly advancing, and the company
seems to be on a very fair and solid basis.

An Excess of Telegraphic Labor.

THE fact is patent to all who are familiar with tele-
graphy in this country, that at the present time the
supply of operators, good, bad and indifferent, is in
excess of the demand. We do not mean to be under-
stood that there is an excess of really first class opera-
tors, of such there is never an over supply. But, tak-
ing the fraternity as a whole, there are too many of
them seeking employment. Any check to telegraphic
development and extension, such as has been ex-
perienced during the last year, of course limits the
demand for telegraphers. Besides this, there has been
for two or three years past a very constant and numer-
ous addition to the ranks. In addition to those who
are constantly being inducted into the business through
the thousands of telegraph offices throughout the coun-
try, the so-called telegraph institutes, schools and col-
leges, through their specious and lying circulars, are
constantly attracting a large number who are led to
believe that a few weeks' or months' practice and train-
ing, such as they afford, will enable any person to at
once secure pleasant, easy and lucrative telegraphic
situations.

A correspondent in Philadelphia, whose communica-
tion we print this week, instances one such establish-

ment there which is doing a large business and proposes to turn out 200 plugs per annum. There are many others in different parts of the country, and although but a small proportion of their so-called graduates succeed in permanently obtaining situations, yet they and to the pressure upon the market for such labor, and have an influence in depressing the compensation of those who are more competent.

We must confess that it is much easier to indicate the existing condition of things than to suggest a remedy. It is evident that no amount of exposure of these so-called telegraph schools has any appreciable effect in diminishing the number of their victims. The fact is that those who patronize them do not see THE TELEGRAPHER, and as a general thing have but little acquaintance with telegraphers. They credit the lying statements in the circulars, invest their money and time before investigating the actual conditions. A "Professorship" in a telegraph college is the resource of many incompetent and broken down telegraphers who have failed to obtain an honest livelihood by the practice of the art.

As to the number who are constantly being learned in the telegraph offices, we see no way to limit them either. Almost every manager or operator has his friends whom he proceeds to induct into the profession, or takes a student to relieve him of a portion of his duties and labors. Human nature is the same all the world over.

In addition to the other supposed inducements for engaging in telegraphic pursuits, there is a fascination about it for many young people which powerfully attracts them towards it. This fascination it is true is generally cured when it is found that the business is a laborious and not excessively remunerated one, but by that time the late enthusiast has become one of the fraternity and has come to regard it as his means of livelihood.

It is true that the ranks are constantly being depleted by the abandonment of the business by telegraphers for other employments, but unfortunately a majority of those who thus transfer their services are of the better class of operators of whom it has been stated there is no surplus. They are driven out by the pressure of the crowd who are constantly seeking employment, and who can usually obtain better compensation as telegraphers than their ability and efficiency would secure them in any other line of business. As an inferior will invariably and inevitably drive out of circulation a superior currency, so too often is it the case, that the less competent so reduce the standard of telegraphic compensation, as to drive out of the business many of those of more ability and better qualified to discharge its duties.

The above we consider to be a fair statement of the present conditions. Can any of our correspondents suggest a practical and effective remedy?

Personals.

THE address of Mr. CHARLES MAYNE is desired. When last heard of he was in Illinois. Any one who knows his present address is requested to communicate it to Mr. CLIFF E. MAYNE, Western Union Telegraph, Cromwell, Iowa.

Mr. VIC. ALBITZ has been appointed night operator in the superintendent's office, Clarksville division, L. & N. & G. S. R. R., vice Mr. F. H. BRITTON, removed.

Mr. W. L. WILLIAMS has been transferred from Stewart, Tenn., to Tenn. River, Tenn., L. & N. & G. S. R. R., vice Mr. L. L. CRIDER, removed.

Mr. C. H. HALL has been appointed operator at Stewart, Tenn., L. & N. & G. S. R. R.

Mr. FRANK KING, operator at Guthrie, Ky., and Mr. G. E. BREED, operator at Paris, Tenn., L. & N. & G. S. R. R., have exchanged places.

Mr. C. O. PIERSON has been appointed night operator at Paris, Tenn., L. & N. & G. S. R. R.

Mr. CHARLES J. BARCLAY, formerly with the Pacific and Atlantic Telegraph Company at Pittsburg, Pa., has accepted a position with the Central R. R. of N. J., at Elizabeth, N. J.

Mr. H. C. HOPE, formerly with the P. & A. Tel. at Minneapolis, Minn., has accepted a position with the St. P. & S. C. and S. C. & St. P. R. Rds. at St. Paul, Minn.

Mr. D. D. KENNEDY, formerly report operator at Milwaukee, Wis., has just returned from Texas, where he has been for his health. He leaves next week on his way East.

The Telegraph.

By Cable.

UNTIMELY DEMISE OF THE LIGHT CABLE COMPANY.

LONDON, February 27.—The company which issued proposals a few weeks ago for laying a light telegraph cable between England and America has abandoned the enterprise, because of scanty support, and gives notice that the money deposited by subscribers to its stock will be returned on demand.

A New and More Commodious Western Union Office at Cincinnati.

THE Western Union Company have secured the large and well known building, corner of 4th and Vine streets, Cincinnati, Ohio, possession to be given May 1st. This is one of the most prominent locations in the city, and this move will, no doubt, give general satisfaction to the public, while the employees of the company are delighted with the prospects of the more commodious quarters promised. The building will not be occupied by the telegraph company before late in the summer, owing to the time required to make the necessary alterations and fitting up of so large an office.

Cable Communication between Jamaica and Porto Rico.

ADVICES from Kingston, Jamaica, of February 21st, state that the West India and Panama Telegraph Company have laid a second telegraph cable to Porto Rico from Jamaica; but this time by the south side to Ponce. There is no land line belonging to the company, and the Government refuses the use of the new line to the company. Messages, therefore, between Ponce and St. Juan travel in the mail bags, and cause a delay of thirty-six hours in the passage.

Foreign Telegraphic Notes.

ACCORDING to the official return of exports, the value of telegraphic wires and apparatus forwarded from the United Kingdom, for 1873, had increased from £405,318 in the previous year to £2,359,563.

The report of Hooper's Telegraph Works shows an available total of £35,519, and recommends a dividend of £1 per share, making 17½ per cent. for the year, and leaving £10,519 to be added to the reserve, thus raised to £26,214. The company are about to carry out a contract for a cable from the Cape via Natal and Mauritius to Aden.

The directors of the Telegraph Construction and Maintenance Company propose paying a dividend of 20 per cent. (£2 8s. per share), in addition to the interim dividend of 5 per cent. already paid, carrying forward about £19,000. At the corresponding period of last year the dividend was 24s. per share.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended February 7, was 293,990; an increase on the corresponding week of last year of 73,186.

Telegraphic and Electrical Brevities.

SUPERINTENDENT WALLICK, of W. U. Co. at Indianapolis, Indiana, has recently supplied Terre Haute office with a Calland main battery of 100 cells, and will shortly place a still larger one of the same kind at Evansville, Ind.

Coleman Wilson, the blonde of the Union Depot office at Indianapolis, has gone to Chicago to settle a difficulty with Mr. Summers, the electrician, but as Coleman had his hair cut just before starting, his friends need not be alarmed for his safety.

Annual Report of the Atlantic and Pacific Telegraph Company for 1873.

THE annual report to the stockholders of the Atlantic and Pacific Telegraph Co. for the year 1873 has been issued. The following is the report of the General Manager, Mr. E. D. L. Sweet, and the financial statement which is appended. It will be noticed that only the gross receipts of the company for 1873, are given, the accounts for that year not having been completed at the time of the annual meeting January 28, last:

ANNUAL REPORT OF THE EXECUTIVE MANAGER FOR YEAR ENDING DEC. 31ST, 1873.

To the President of the Atlantic and Pacific Telegraph Company.

SIR:—In accordance with the requirements of the Company, I beg to submit a brief report of what has been done in my department during the past year, with such information and explanations as seems to be desirable for your consideration at this time.

During the past year connection has been made with Oil City, Pa., by the erection of a wire upon our present poles from Cleveland to Oil City (139 miles). Ten miles of wire has been strung on our present poles from Sandusky to connect with a line to Put-in-Bay Island, Lake Erie. Further construction has been done at different points—principally at Albany (to avoid the necessity of a cable across the river); at Buffalo, Toledo and Detroit (for the purpose of connecting with the wires of Railway Companies); and at Chicago and other offices to enable the establishment of branch offices and connections with other companies; also, 403 miles of poles and wire line agreed to be purchased, which will give the Company 3,199½ miles of pole line and 7,680½ miles of wire.

The total receipts of the Company for the year, as you will see by the Treasurer's report, amount to \$372,627.81, being an increase over last year of \$32,504.49.

The number of messages sent and received during the year, exclusive of press and signal business, 933,850. This business, if done at the same tariff rates obtained on the business of last year (51 cents), would have yielded \$476,263.50. The total number of messages sent and received during the year, including press and signal business (25 words to each message), 1,093,350.

On the 1st day of February the tariff to California was reduced from \$5.00 for a message of ten words to \$2.50. The effect of this reduction, though large, was overcome during the first six months of the year, and the business showed an increase of net earnings over the same months in last year.

On the 1st day of July a further and general reduction of rates was made. It is believed, however, that this reduction would have been overcome, during the last six months of the year, by an increase of business but for the financial crisis in September, which almost wholly stopped the movement of produce at the time of the year when our receipts are usually the largest from that source, and no substantial relief was felt until very near the close of navigation.

Considering the reduction of rates in February and July, and for a time the almost total suspension of business, so far as transactions in stocks and produce were concerned, in the latter part of September and during the month of October, I think the company has every reason to be satisfied with the net results of the year as compared with that of 1872.

On the 1st of January the Pacific and Atlantic Telegraph Company ceased to do business as an independent company. Although the business interchanged with that company has amounted to a considerable sum per month, it is believed that the benefits derived from that connection will be almost wholly overcome by the increase of business coming to us between competing points which was previously divided, and when the value of territory opened to independent companies, by the extinction of the Pacific and Atlantic as a competing company is considered, it is believed that its loss to the independent system will ultimately prove a benefit.

The relations between the Atlantic and Pacific and Franklin Companies have been finally and fully settled, and the like harmonious relations with the Southern and Atlantic Company leaves the present independent companies unembarrassed, and with every encouragement to go on in the extension of their lines, until such an amount of territory is covered as will insure a complete success to the independent system of lines. In order to secure this success, however, the central portion and prominent objective points of the country must be covered. This is necessary for the enjoyment of a general business, as also for the establishment of a press service which may be relied upon for a large amount of business.

To complete such a system it will be necessary to reach New Orleans, Galveston, Louisville, Memphis, Nashville and St. Louis, which, with additional cross and lateral lines to be acquired generally without monied expense to the companies, will enable us to build up a business which cannot fail to yield a handsome profit.

Negotiations are in progress which it is believed will secure not only harmony and concert of action, so far as the erection of new lines are concerned, but also secure to the present companies' lines all the benefits of new and improved systems of telegraphing.

Since the last annual meeting of the company an Atlantic Cable Company has been organized in this country and in England. The requisite money has been obtained, and contracts with a responsible party, having ample facilities for its manufacture and for lay-

ing the same have been made, and it is expected that by the first of August next that the independent lines of this country will have a direct exclusive connection with Europe.

The text of a contract for exclusive connection and interchange of business between the Atlantic and Pacific and Franklin and the Cable Company has been written and substantially agreed upon between the negotiating parties, and is now the subject of executive consideration.

The want of such a connection with Europe has been one of the most serious drawbacks to the independent companies, both as regards general business and press service.

Taking everything into consideration, I feel warranted in saying that the promise of success in building up an independent system in this country has never been so flattering as at this moment.

Both of the companies under your charge are free from debt, with a surplus of capital in the treasury. Both have earned satisfactory profits during the past year, notwithstanding the embarrassments encountered.

Such a state of things has never existed in the history of any previous attempts to build up a competing telegraph system.

We have passed the point where all other attempts have failed, and it only remains to go forward with the same careful management that has characterized the past history of the companies during your official connection with them.

Very respectfully,

E. D. L. SWEET, Executive Manager.

January 27th, 1874.

CAPITAL STOCK.

Authorized Capital Stock.....	\$10,000,000	
In 100,000 Shares of \$100 each.		
Authorized Capital Stock, Shares.....	100,000	
Capital Stock issued to December 31st, 1873, Shares.....	85,895	
Capital Stock to be issued under contract by which A. & P. Co. acquire 260 miles additional Poles and Wire.....	1,690	87,585

Reserved Stock belonging to the Co. and to be sold or applied to its benefit.....	12,415	
---	--------	--

PROPERTY OWNED BY THE CO.

Miles of Pole Line.....	3,065
Miles of Wire, with all necessary equipment....	7,460

200 offices with all necessary furniture, instruments and fixtures. The Company owns sufficient instruments, batteries, office wire, &c., to equip 250 offices. Stationery and general supplies sufficient for two months' use. Rights of Way and franchises in principal Cities and Towns in and from New York via Albany, Buffalo, Cleveland, Chicago, Omaha and on line of Union Pacific Railroad. A majority (5,100) of the shares of Capital Stock, and a controlling interest in the Franklin Telegraph Company.

FINANCES.

No notes, bonds, or floating debt. In 1872 the company declared a stock dividend, but has not paid any cash dividend, the surplus over all expenses earned each month for over two years past having been expended for additions to lines.

Gross receipts for year ending December 31st, 1872, consisting of	
Gross receipts for business.....	\$336,895 34
Premium on Gold...	3,054 33
Interest on deposits,	174 65
	<u>\$340,123 33</u>

Gross expenses for same term, consisting of Rents, Salaries, Messengers, Battery, Stationery, Repairs, and all classes of expense,	<u>292,720 55</u>
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Net Profit, 1872.....	\$47,402 77
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NOTE.—The interest in Franklin Telegraph Company was acquired during the year 1873, and none of the profits accruing from the ownership of such interest appear in the foregoing exhibits of A. & P. Co.'s business.

The accounts of 1873 are not yet complete, but each month of the year shows a net profit over all expenses, notwithstanding that in February, 1873, the tariff from New York to San Francisco was reduced from \$5 to \$2.50 for ten words, and in July, 1873, large reductions in tariff were made over the entire lines of the company east of Chicago.

THE magnetic telegraph, whose early advocates were ridiculed as impracticables and visionaries, has achieved a success unparalleled in the world's history. Electricity and the telegraphic art are revolutionizing society, and are yet destined to a further development which will surprise even those most sanguine in regard to their future.

QUOTATIONS OF TELEGRAPH STOCKS DEALT IN AT THE N. Y. STOCK EXCHANGE.

NAME OF COMPANY.	MARCH 2.		MARCH 3.		MARCH 4.	
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.
Western Union.....	75½....74		74½....74½		74¼....73¼	
Atlantic and Pacific.	17 ...16½		16½....16½		.....
American District...	58 ...58		60 ...58		56	

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended January 20, 1874, and bearing that date.

No. 146,638.—FIRE ALARM TELEGRAPH. Lewis H. McCullough, Richmond, Ind., assignor of two thirds his right to Elwood Patterson and Isaac G. Dougan, same place. Application filed June 21, 1873.

Circuit ordinarily closed through main line and all the signal boxes. Starting any box breaks main line, cutting out all boxes beyond such box and establishing a short ground circuit.

1. In a fire alarm telegraph the combination of an earth for each signal box with an earth of the battery at the main station, substantially as and for the purposes set forth.
2. In a fire alarm telegraph the combination of the main line alarms, which when brought into action break the continuity of the main line, an earth for every alarm box, and an earth of the battery at the main station, substantially as specified.
3. The line wire metallicly connected with one end to the alarm, and with the other end to an insulated metallic plate *c*¹, in combination with the circuit breaker *c*² on the sliding rack *E*, which winds up the motor ground wire *k*, and a mechanism for closing and breaking the connection between the line wire and the ground wire.
4. The combination of the line wire connected to the alarm, as described, the sliding winding rack *E*, carrying the circuit breaker *c*², circuit disk *F* *f*¹, ground wire *k*, and spring *h* with or without the insulated disk *G*, substantially as set forth.

For the week ending January 27, 1874, and bearing that date.

No. 146,812.—TELEGRAPH SIGNAL BOX.—Thomas A. Edison, Newark, N. J., assignor to American District Telegraph Company, New York, N. Y. Application filed December 3, 1872.

Improvement on patent 129,526, for district alarm telegraphs. Contact springs made adjustable; sounding magnet unconfined.

1. The circuit springs *l n*, attached by slots and screws, so as to be adjustable in their length and power, as set forth in combination with the wheels *d e*, as specified.
2. The combination of the electro-magnet *m* beneath the clock-work, the adjusting armature-lever, screws 13 14 outside the clock-work, and the shaft 16, for adjusting the spring 15 above the lever and through the clock-plates *c c*, all arranged as and for the purposes set forth.

No. 146,953.—APPARATUS FOR LIGHTING GAS BY ELECTRICITY.—Adolph Theodor Smith, New York, N. Y. Application filed December 13, 1873.

Key making and breaking battery-circuit over gas tip is vibrated by a toothed segment attached to a hand-operated cock.

1. The toothed segment *b* and cam *g*, in combination with the gas-cock *D*, vibrating key *E*, dog *h*, tip *e*, gas-burner *A*, and point *a*, all combined and operating substantially in the manner herein shown and described.
2. The combination of a toothed segment, *b*, with a gas-cock *D*, key *E*, tip *e*, gas-burner *A*, and point *a*, substantially as set forth.

Died.

FIRMAN.—At Chicago, Ill., February 26, 1874, HORACE L. FIRMAN, aged 12 years, the eldest son of Mr. L. B. Firman, General manager of the American District Telegraph Company of that city.

PORTER.—On Sunday, February 22, 1873, at Albion, N. Y., after a protracted illness, SAMUEL PORTER, one of the early pioneers in telegraphy in this country, aged 55 years.

Obituary.

SAMUEL PORTER.

The death of Mr. SAMUEL PORTER, which occurred at Albion, N. Y., February 22, again impresses upon us the fact that, one by one, the early pioneers in telegraphy in this country are rapidly passing away, and that a new generation is taking their places. We have known Mr. Porter for many years, and well recollect the time when he was as well and generally known in telegraphic circles, as those who are to-day recognized as leading telegraphic managers.

The introduction of the deceased into the telegraph business occurred originally from his association with the late Professor Morse, with whom he became acquainted from having been employed as a clerk in the office of the New York Observer. Through this acquaintance he became very much interested in the invention of the magnetic telegraph, then being perfected, often assisting Prof. Morse in his investigations and experiments. Naturally, from the interest thus awakened, he engaged in telegraphy as a business immediately after the experimental line between Baltimore and Washington was constructed in 1844. In 1845 this line was extended to New York, and it was not long before the telegraph wires were extended to Albany and Buffalo, N. Y. After assisting in constructing and operating the line through the State, Mr. PORTER engaged in the construction of the Buffalo and Toronto line, he being the first to stretch a telegraphic wire across the Niagara river, which was done in 1846. He also was engaged in extending the wires across the St. Lawrence river into Montreal.

We have not the space to follow him through his telegraphic career in detail, but, as will be known to many of our older telegraphic readers, he was subsequently prominently engaged in the construction, opening, and management of telegraph lines in the Northern and Western States. Becoming interested in the Printing Telegraph invention and improvement of Professor ROYAL E. HOUSE, he for some time held the position of Superintendent and Manager of the New York, Albany and Buffalo House line. Subsequently, in 1852, he originated the project of a marine line between this city and Sandy Hook.

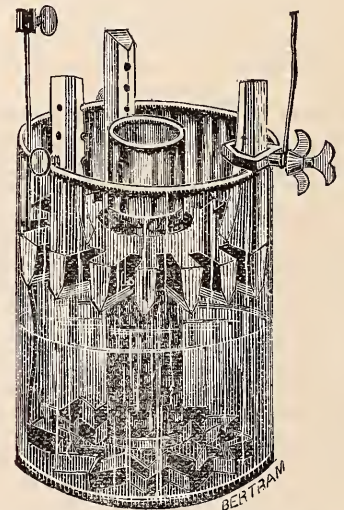
He was engaged also in the construction of the first competing telegraph line, under the United States Telegraph Company, from Chicago to Omaha, St. Paul, and other important points in the West.

During the later years of his life Mr. PORTER's health was evidently giving way, and two years ago, after opening telegraph offices along the Buffalo, New York, and Philadelphia Railroad, and getting the line into successful operation, he was obliged to resign his position, and from that time has been gradually failing, and unable to attend to business.

Mr. PORTER had many friends among the telegraphic fraternity, with whom for so many years he was intimately associated, and although of late years not prominently connected with telegraphic enterprises, he will long be remembered as one of those by whose personal exertions, talent and enterprise, the magnetic telegraph in this country became an established institution, and entered upon that process of development, the end and extent of which cannot even now be foreseen.

At length his earthly labors and trials are over, and he sleeps quietly and peacefully in the grave, which is to us all, sooner or later, the final termination, however earnestly and faithfully we may strive during the brief years which are granted to us here. His mortal remains were taken to Geneva, N. Y., and deposited with those of his kindred.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

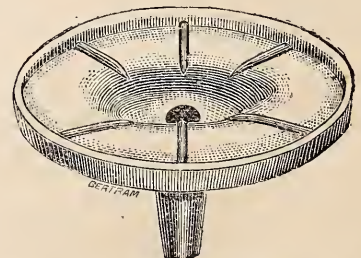
All kinds of Battery and Battery material for sale by

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use.

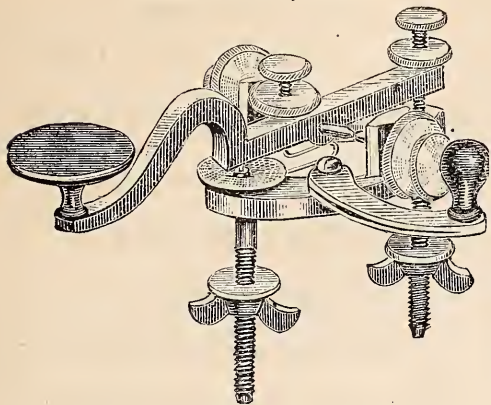
Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

WATTS & CO.,
BALTIMORE, MD.



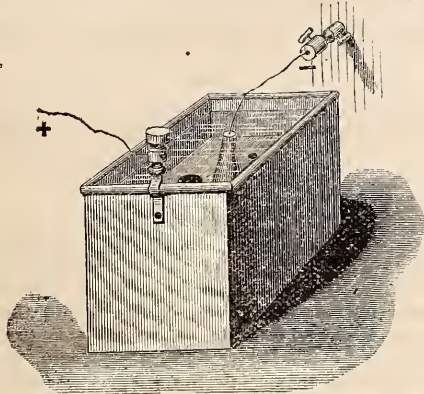
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25. On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.)

38 VESEY STREET, N. Y.

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OUR PROFITS HAVING BEEN AMPLE,
WE OFFER OUR CUSTOMERS THE
BENEFITS OF THE RECENT
REDUCTION
IN THE COST OF LABOR AND MATERIAL.

ALL WHO NEED

TELEGRAPH INSTRUMENTS and SUPPLIES,

IN

Large or Small Quantities,

WILL CONSULT THEIR OWN INTERESTS BY PURCHASING
FROM US.

SEND FOR OUR NEW PRICE LIST.

A Special Discount given on Cash Purchases.

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- " " AMERICAN COMPOUND WIRE.
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IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER,
No. 3.....\$4 00
- A WELL FINISHED AND GOOD WORKING SOUNDER,
No. 4..... 3 00
- A WELL FINISHED AND GOOD WORKING KEY, No. 4. 4 00

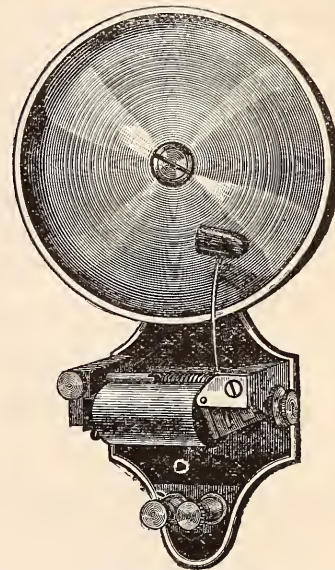
Instruments, Line Material, Office Wire, Magnet Wire, Tools,
Battery Material, Chemicals, Books, Stationery,
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Special attention given to REPAIRS and MODEL WORK.

W. HOCHHAUSEN,
Manufacturer of
ELECTRICAL INSTRUMENTS,

132 WILLIAM STREET (rear),

Between Fulton and John Streets, NEW YORK.



One half of actual size

ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard.
Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00

Sounders, from..... 4 50 to \$6 50

Electric Bells, single stroke or continuous ringing,
from..... 5 00 to 8 00

Relays, from..... 9 50 to 16 00

Improved Switch Keys, from..... 3 00 to 5 50

Send for Illustrated Circulars.

The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

JEROME REDDING & CO.,
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MANUFACTURERS AND DEALERS IN

Electrical and Telegraph Instruments.

A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS
CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,
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PATENT ELECTRIC WATCH-CLOCK
THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

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Battery Carbons all sizes, with Improved Connection

MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS,
AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

A **AMERICAN FIRE ALARM AND
POLICE TELEGRAPH.**

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,
General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,
General Agent for the West and North-West.

J. R. DOWELL, Richmond, Va.,
Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,
Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,
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ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,
Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF
FIRE ALARM & POLICE TELEGRAPH
WITH A CENTRAL OFFICE,
OR
UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND
UNIFORM RELIABILITY.

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|---------------------|----------------------|
| Albany, N. Y., | New York City, |
| Alleghany, Pa., | New Orleans, La., |
| Boston, Mass., | New Bedford, Mass. |
| Bridgeport, Conn. | New Haven, Conn., |
| Buffalo, N. Y., | Newark, N. J., |
| Baltimore, Md., | Omaha, Neb., |
| Chicago, Ill., | Philadelphia, Pa., |
| Cincinnati, Ohio, | Pittsburg, Pa., |
| Columbus, Ohio, | Portland, Maine, |
| Cambridge, Mass., | Peoria, Ill., |
| Charlestown, Mass., | Providence, R. I., |
| Covington, Ky., | Quebec, L. C., |
| Detroit, Mich., | Rochester, N. Y., |
| Dayton, Ohio, | Richmond, Va., |
| Elizabeth, N. J., | St. Louis, Mo., |
| Fall River, Mass., | St. John, N. B., |
| Fitchburg, Mass., | Springfield, Mass., |
| Hartford, Conn., | San Francisco, Cal., |
| Indianapolis, Ind., | Savannah, Ga., |
| Jersey City, N. J., | Syracuse, N. Y., |
| Louisville, Ky., | Troy, N. Y., |
| Lowell, Mass., | Taunton, Mass., |
| Lawrence, Mass., | Toledo, Ohio, |
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The Automatic Signal Boxes.

Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

**FIRE ALARM
AND
POLICE TELEGRAPHS,**

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the original **FARMER & CHANNING PATENTS**, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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104 Centre Street,
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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

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 Resistance Coils, Submarine Cables,
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer.

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Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, steel, etc.

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And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

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It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

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which is the best watchman's time recorder in the world. Also,

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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

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FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

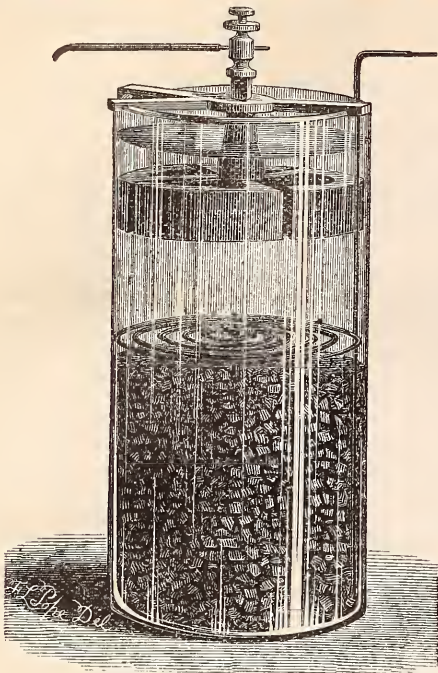
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch. The layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY

AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873:

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

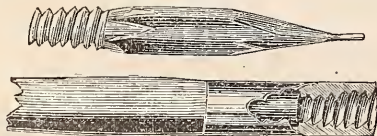
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

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LOCKWOOD BATTERY CO.
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ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

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COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

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CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

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Our WRECKING INSTRUMENT is still popular with managers of Railroad Telegraphs who find an attractive combination, giving loud sound without materially increasing the resistance beyond the standard of their relays.

We have rewound some of the old Box Sounders, in which we found the helices to have a resistance equal to 400 and 450 ohms. None of our Wreckers have over 175, while 150 is the standard.

Brass or nickel plated always on hand. No local required. Always ready for temporary offices. Just what is wanted for officers' cars. Two sizes black walnut cases. Handsome leather cases, velvet lined, to order.

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RHUMKORFF COILS, from ¼ to 10 inch spark.

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INSULATED WIRES for special purposes made to order.

SILK COVERED SWITCH CORD, one, two or more conductors. PATENT MESSAGE HOOKS, the best ever introduced, prices 65c. and 75c. per dozen.

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PURE CHEMICALS AT LOWEST PRICES.

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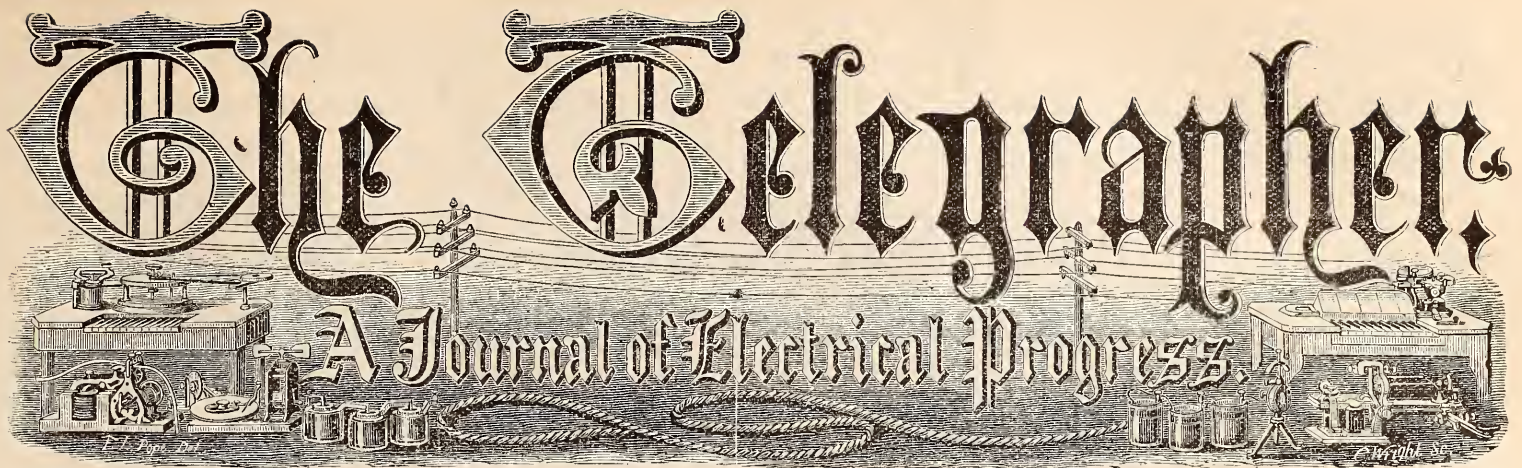
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, March 14, 1874.

Whole No. 400

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"Pope's Modern Practice of the Electric Telegraph,"
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MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
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EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
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CHARLES WILLIAMS, JR.,
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DAY'S KERITE COVERED WIRE.

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(PATENTED, NOVEMBER 18TH, 1873.)
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Having recently enlarged our factory, we are now prepared to furnish at short notice any style and quantity of
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saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.
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AMERICAN DISTRICT TELEGRAPH CO.,
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Respectfully,
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We warrant all Wire to be of the highest conductivity, tested by our Galvanometer, which compares with the tests of the highest authority in this country.

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(PATENTED JUNE 24, 1873.)
This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.
Price, complete, Sounder and Key mounted on finely finished Mahogany Base, with one Cell Hill's Patent Battery, with Chemicals, eight feet of Office Wire, and "Smith's Manual of Telegraphy"..... \$7 50
Two sets..... 14 50
Price of Sounder and Key only..... 6 50
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Arrester attached.....
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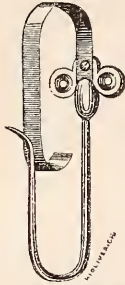
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THE "SNAPPER,"
a Mechanical Sounder and Key combined—giving a remarkably sharp and clear sound—weighs but half an ounce, and can be carried in the vest pocket.
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wants one. Sent post paid on receipt of THIRTY CENTS.
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in the Roll and Sheet.
We make the manufacture of Electric Wire a specialty—especially the finer sizes of Copper for conduction, and German Silver for resistance purposes—guaranteeing the conductivity of the same in every instance to be superior to that of any other manufacturer in the market.
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Late Assistant Examiner of Electrical and Telegraphic Apparatus,
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SOLICITOR OF PATENTS,
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SECURITY MESSAGE HOOK.



PATENT APPLIED FOR.

The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.
Price.....30 cents each.
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Liberal terms to the trade.

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A large lot of well polished and good working Relays for sale very cheap; also, several sets of
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AND ALL KINDS OF
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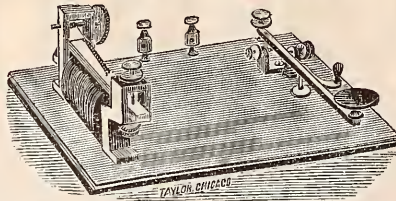
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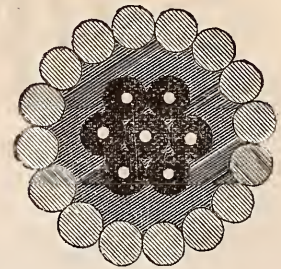
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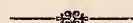
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MARCH 14, 1874

VOL. X. WHOLE No. 400.

(From *The Ghost*.)

Little Tip McClosky.

"You remember little old Tip McClosky? He passed through here yesterday *en route* to Mexico. He has grown old since I saw him before, and they tell me he is a 'little off' on his working, and that the nice copy he used to put up has got to be a trifle snid. Gin has been playing fast and loose with his nerves, I fancy, and his palmist days, telegraphically speaking, are over."

I extract the above from a private letter bearing the date of New Orleans, March 6th, 1874. So little Tip has come to the surface again, after all these months in which his friends have been wondering if he was alive! Of course I remember him. Everybody remembers him. Ten years ago it was no small affront to the telegraphic profession in general not to know Tip McClosky. Long before I had carried my last message and been promoted to the position of operator in a way office, I had learned the history of his achievements by heart. I should be almost ashamed to-day to tell you how much I revered that man long before I had ever seen him. No rapt listener to the enchanting stories of "Sinbad," "Aladdin," or any of the others with which Scherezade beguiled the Arabic ruler and his attendants through the fleeting hours of those one thousand and one nights, ever paid more faithful attention to the clever wife than I to those who made little Tip's the burden of their song. I installed him in my boyish heart as a man fit to rank with Aramis or Athos, with Porthos or D'Artagnan, and the genius of Dumas has not clothed the "Three Guardsmen" and their Gascon mate with braver laurels than those with which I crowned my hero, or attributed to them greater or more numerous virtues than those with which I formed a halo to crown Tip's curly head.

The worthy Mr. Tip was generally known as a man who never "broke," and he travelled, got trusted, borrowed money, and obtained new situations in spite of frequent dismissals, on this reputation. It was he who received Buchanan's message at Worcester, Mass. It came through a button repeater at Providence. Tip afterwards made his boast that he was the only man in the New England States who took the whole message without a "break," and I think he was. The auburn haired operator who copied the message at Providence said that Worcester was accidentally cut off in the middle of that official document for fifteen minutes, and if Tip got the whole message he of the carrotty scone was a clam, that's all. I will not discuss the merits of this difference of opinion; it is a trivial matter. In Atlanta, Ga., Tip made a wager that he could walk from his instrument to the outside door, where he was to be met by a boy from a neighboring restaurant with a gin sour on a waiter, drink the "medicine" and resume his work without interrupting the sender—and he did it. The Atlanta paper said, in an editorial paragraph, two days later: "Our article of yesterday on the indiscretions of J. C. Lamont would have been characterized by less spirit had we known him to be a relative of the late Henry Clay. The Associated Press despatch, on which our article was based, stated distinctly that Lamont was a nephew of old Dan Webster, of Massachusetts." The other papers in that locality, whose "press" was taken on the same wire, had it Henry Clay, but Tip's reputation saved him. There is no doubt in my mind that the rest of the men on that wire were a set of unmitigated plugs and guessers. Tip worked the old National wire at New York in 1863. This was a great circuit in its day, and the amount of business sent *via* Pittsburg was enormous. Owing to an inordinate appetite for dramatic performances, he whiled the most of his evenings away at the Bowery Theatre, and because of this, and a habit of indulging in "revelry by night," after the entertainment, it was usually late before he sought his couch. As sleepiness is a natural sequence of unrest, and as ten or fifteen "horns" of beer a day do not conduce to wakefulness under these circumstances, Tip was generally drowsy, and whenever he was "clear" he laid his head upon the table and went to sleep. The office boys, by whom he was regarded as a sort of demigod, manifested their interest in his welfare by always being on the alert for calls. When they heard Pittsburg calling they aroused Tip from his slumber.

He would open the key, stare about sleepily for a moment, and then command his friend at "G" to "let 'em come and cut 'em all to bits." Then, to the admiration of all about, he would sit and copy message after message in a beautifully flowing chirography, oftentimes carrying on a lively conversation with his companions. And he *didn't* "break" in *seventeen months*. But there were bigoted citizens of New York who conspired against him. One illustration will suffice:

Dr. Janvier received a message from his wife stating that "Mr. Sage has caved and is satisfied." Now, I maintain that if Mr. Sage had caved he *ought* to have been satisfied. But not so with Janvier. He demanded a repetition, and the telegram read "Message received and is satisfactory." I have no patience with your modern Galens, and I never doubted for a moment that Janvier was prejudiced. The occasion of the memorable Army of the Republic celebration in Boston, in 1868, found Tip a night report operator at Titusville, Pa. It was on that night he demonstrated to a coterie of friends the feasibility of reciting "Casabianca" and receiving "press" simultaneously. The next morning the *Journal* announced in its telegraphic columns that "Post No. 1 was commanded by an Irishman from New Bedford;" and the New Bedford *Standard* hastened, a day or two later, to copy the despatch, and explain that Post No. 1 was really commanded by A. N. Cushman, from New Bedford. It added, moreover, that Mr. Cushman was less of a Milesian than the telegrapher. This was evidently a fling at Tip's nationality, and I have never ceased to despise the carping nature of a newspaper that would make such an observation.

When the Pacific Railroad was opened Tip and Jim Lawless joined the numerous company who, pinning their faith on the star of empire, followed it across the Missouri, through the land of sage brush and alkali, and beyond the snow capped heights of the Sierras. I never heard of McClosky but twice during his whole Western tour, and his sojourning on the Pacific coast. He was put off a train, and came sauntering into the office at Wasatch, in Utah, one morning, and depositing an old enamelled cloth satchel, tied up with a piece of line wire, on the counter, he said to the operator: "Just you keep your eye skinned for that trunk, George, and I'll go out and lie down." The satchel was empty; that was obvious on the first glance. The operator tossed it on an adjacent shelf and went about his business. The budding season ripened into glorious summer, those delicious days when the sun is up early and goes not down till late, came and went, but Tip came not. One afternoon, however, when the grain and fruits were bending with their wealth, and all nature had grown magnificent in her abundant harvest, he swaggered jauntily from an eastern bound train, and called for his satchel with an air indicating that his absence had merely extended over an hour or two. He had not improved in personal appearance in the interval. A red shirt, a pair of jean pantaloons, an old felt hat and a suspender, long separated from its mate, constituted what

"Pledges of our fallen state"

adorned his person. He had been "down to Frisco," he said, "and had seen trouble." Slowly he unwound the line wire from his unique trunk, cautiously he opened its widely gaping mouth, then plunging in his hand and feeling all around, he observed with considerable emphasis: "I should like to know the name of the black hearted Mormon who went through me for that red velvet vest." It was not without difficulty that he was persuaded to quit Wasatch; and when he did shake the dust of that polygamous section from his honest skirts, he mentioned privately to the train despatcher, as the train glided haughtily away, "that probably he would find that 'cylinder escapement' vest in Omaha." But my correspondent makes no mention of his wearing in New Orleans a garment resembling the ruby wine, so I fear he never found it. Perhaps he goes now to seek it in the laud of the Montezumas.

JOHN OAKUM.

Launch of the Cable Ship Faraday.

THE new cable steamship *Faraday*, which has been built by Messrs. C. Mitchell & Co., Newcastle, for the Messrs. Siemens Brothers, for the purpose of laying their Atlantic cable, was launched on the 17th of February last. The occasion seemed to be one of considerable interest. There was a large concourse of spectators, and lady and gentlemen visitors were present from all parts of the district. The launch was of the most successful character, everything passing off without a hitch. Half past three o'clock was the time fixed, and shortly after that hour the signal was given. Imperceptibly, almost, the vessel began to slip from the ways, and as her bow left the gangway occupied by Mrs. Siemens, of London, and a party of friends, she was named the "*Faraday*" by that lady, who completed the ceremony by sacrificing the customary bottle of wine. The giant structure slid gently down the incline, and dipped easily into the water amidst the cheers of the sightseers. By means of an immense ca-

ble chain, attached to anchors firmly embedded in the ground, she was brought up in midchannel, and was quickly taken in hand by a number of active little tugs and towed up the river. The vessel has been built to the order of Messrs. Siemens Brothers, London, for the purpose of laying their Atlantic cables, and in every requisite the ship is certainly one of the most perfect of its kind. The steamer is 360 feet long, 52 feet beam and 36 feet deep. Her gross register tonnage is about 5,000, and her dead carrying weight about 6,000 tons. The iron hull, built under the inspection of Lloyds' agents, will be accorded the highest certificate of classification. From her peculiar structure the vessel receives enormous strength, in addition to the usual requirements of Lloyds' rules. Supporting the sides of the vessel are three enormous cable tanks, constructed of plate iron, and forming a series of double arches. These are united together, and attached to the general fabric of the vessel by five iron decks. For the comfort and convenience of those on board, the upper and main decks are supplemented by the usual decks of wood. The *Faraday* is double bottomed, and in the space below the two bottoms is a network of iron girders for carrying the cable tanks, and these give also a longitudinal strength to that portion of the hull. Water ballast is also carried in this space, by which the ship may be trimmed as the paying out of the cable is carried on. This arrangement has likewise the advantage of dispensing with cargo or other dead weight beyond fuel. For the purpose of filling and emptying any single compartment of the double bottom, or for flooding any one of the cable tanks, a complete and well devised system of valves, cocks, pipes, and auxiliary engine power has been introduced, and the "system," which is worked from the engine room, is under the control of the engineers. The bow and stern of the vessel is of the same form, and in this respect she is unlike other vessels in outward appearance. Rudders are provided at each end, and she can thus be navigated ahead or astern, as may be desired, when "paying out" or picking up a cable. Each rudder, to provide against accident, is supplied with strong screw steering gear, worked in the usual manner by manual power, and the steering is accomplished by means of a steam engine placed amidships. Harfield's steam windlass works the anchors and cable chains, and steam apparatus, placed in various positions along the deck, performs all the heavy labor about the vessel. The rigging is after the most approved manner of ocean steamers, and the accommodation provided is of the most complete nature for the large staff of officers, electricians and crew, numbering about 150 persons. In addition to the multifarious appliances of a cable ship, the vessel will be fitted up with all the cabins and appliances of a large passenger steamer, and will be propelled by machinery of the compound surface condensing principle, which has been constructed by Messrs. T. Clark and Co., of Newcastle. To obtain increased steering or manœuvring power—an important condition in cable laying—the steamer will be provided with two propellers, commonly termed "twin screws," which will be worked by two separate sets of engines, placed vertically over the shaft, with two cylinders, one at high and the other at low pressure. By this means great regularity of motion will be obtained, and by a high degree of "expansion" in working the "system," fuel will be greatly economized, to an extent that would have been considered impracticable a few years ago. The deck machinery for the "paying out" of the cable is being manufactured by the Vulcau Foundry Company, who are experienced in this branch of work. It is needless to say that the *Faraday* has been called after the great English chemist and natural philosopher of that name.

The first employment of this new steamship will be to lay the United States cable for the Direct United States Cable Company. The launch was celebrated by a dinner in the evening, which was very elegantly served in the Assembly Rooms. A brilliant company sat down to the repast.

The Eastern Telegraph Company.

THE ordinary half yearly meeting of the Eastern Telegraph Company was held at the Causton Street Hotel, London, on Tuesday, January 26th. In moving the adoption of the directors' report of the accounts, the chairman, Mr. John Pender, M. P., referred to the negotiations with the Indo-European Telegraph Company for the bringing about of a joint purse arrangement (which would save the expense of duplicating the Red Sea line), he said that the Indo-European Company had met this company in a very fair spirit; but the Governments of Russia and Prussia were largely interested in that company, and, through the exertions of one of the principal shareholders in the Indo-European Company, and the contractors for maintaining the line, he was afraid that, for the moment, the negotiations were not likely to be brought to a successful conclusion. The directors hoped that eventually some arrangement would be carried out. The Levant system had been completed. There was only one hitch

at the present moment; this company had got a cable laying expedition at Alexandria, which was sealed up by the Egyptian Government until the settlement of some little misunderstanding which existed between the Egyptian Government and this company, with respect to the reading of a certain concession from the Egyptian Government. He was hopeful that in a very short time that misunderstanding would be settled. He could only repeat what he had stated on former occasions, namely, that telegraphy once commenced must grow. Telegraphy was still in its infancy. He pointed out that every day would increase the value of telegraphic property, inasmuch as science had now found the means of sending a much larger number of words in the same time; and he also mentioned the important fact that in submarine cables they were now able to telegraph messages from both ends simultaneously.

A Bewildered Father.

GILLINGHAM was in Williamsport the other day, and while attending to his business there he had a strong premonition that something was the matter at home; so, in order to satisfy himself, he determined to run down to Philadelphia in the next train. In the meantime his mother-in-law sent him a despatch to this effect: "Another daughter has just arrived. Hannah is poorly. Come home at once."

The lines were down, however, and the despatch was held over, and meanwhile Gillingham arrived home and found his wife doing pretty well, and the nurse fumbling around with an infant a day old. After staying twenty-four hours, and finding that everybody was tolerably comfortable, he returned to Williamsport without anything being said about the despatch, his mother-in-law supposing, of course, that he had received it. The day after his arrival the lines were fixed, and that night he received a despatch from the telegraph office dated that very day, and conveying the following intelligence:

"Another daughter has just arrived. Hannah is poorly. Come home at once." Gillingham was amazed and bewildered. He could not understand it. Daughters appeared to him to be getting entirely too thick. He walked the floor of his room all night trying to get the hang of the thing, and the more he considered the subject the more he became alarmed at the extraordinary occurrence. He took the early train for the city, and during the journey was in a condition of frantic bewilderment.

When he arrived he jumped into a cab, drove furiously to the house, and scared his mother-in-law into convulsions by rushing in in a frenzy and demanding what on earth had happened. He was greatly relieved to find that there were no twins in the nursery, and to learn how the mistake occurred; but he is looking now for the telegraph operator who changed the date of that despatch. Gillingham is anxious to meet him. He wants to see him about something.—*Max Adeler.*

The Chicago Western Union Female Operators.

UNDER the heading of "Meanderings Among the Maidens," *The Fraternity*, the new telegraphic journal published in Chicago, thus pleasantly discourses of the female operators employed in the Western Union service in that city:

"Not last (and by no means least) in our mention of Chicago operators should be that of the ladies. Of this class of talent we have at present some ten or twelve representatives, and they alone constitute no small portion of the attractions of the office. Although graduates from no particular school of telegraphy, they are, for the most part, masters (?) of the art; the majority of them working city wires, over which, at the lowest calculation, one half of the local business of the company passes *en route* to its destination.

"Strolling through the office in the discharge of our reportorial duties, we notice on the St. Louis circuit Miss Lizzie Veazey. Two years ago this lady was comparatively an inferior operator; to-day she works a wire the standing of which (excepting, of course, the heavier Eastern circuits) is second to none in the office. Some conception of the amount of business passing over this line may be formed from the statement that very frequently the total on both sides of the St. Louis 'slip' exceeds five hundred; and this business is all transacted in a style unattainable by many of her collaborators of the masculine gender."

"On the South Water street wire we find Miss Alice C. Nute. This wire is undoubtedly one of the heaviest in the office transacting metropolitan business; and here the work is done in a manner at which none need complain.

"Miss Ida Snell presides gracefully over Metropolitan No. 2; a wire doing business chiefly with the American District Company's offices, of which there are quite a number on this circuit. At the key Miss S. is *au fait*.

"Miss Jennie Harding, on Lake Shore No. 4, gives complete satisfaction. There is considerable business

transacted on this line, and the skill with which it is handled reflects great credit upon the lady above mentioned.

"In the assignment of Miss M. L. Russell to the Clinton wire the company must have studied their own interests, as well as the comfort of the numerous offices on this circuit.

"Michigan Central No. 2 we find in charge of Miss J. E. Phelps, an accomplished operator of some years' experience. To find business on these hooks when the wire is in working order is a thing of rare occurrence.

"On Illinois Central No. 1 we observe Mrs. Tillotson, a lady of long experience in telegraphing, and one to whom the fatigue connected therewith is very slight.

"The appointment of Mrs. A. O'Connor to the Dauphin wire was undoubtedly a wise one. The business here is considerable, and is executed in the highest style.

"Miss A. J. Fox and Miss Susie Musgrove, on Metropolitan Nos. 1 and 7, respectively, give the most complete satisfaction. Their duties are somewhat arduous, yet performed as only good lady operators can perform them.

"The business on Metropolitan No. 6 has the rare good fortune to be under the immediate supervision of Miss Lillie Smithells. She certainly knows how to do it, and do it as it should be done.

"Among the number recently added to the operating force it gives us pleasure to notice Miss Annie F. Veazey. Notwithstanding her youth she is by no means a novice in telegraphing; and, if our prognostications prove themselves correct, she is destined, at no distant future day, to occupy an enviable position."

A Cable Company in Chancery.

A REMARKABLE instance has been afforded during the week of the ruinous cost of the process of winding up joint stock companies. One of the many schemes which have been put forward from time to time, for providing independent telegraphic communication with America, was "The British and American Telegraph Company." At the time for the order for the winding up of the company, six years since, the whole of the debts, including £7,000 to the promoter, were £10,500. The liquidation costs had been £2,900, and of the solicitor engaged in the winding up £3,850. The Vice-Chancellor remarked upon these facts that he was perfectly astonished to hear that the winding up of this company—the *bona fide* subscribed capital of which was only £4,500, and the legitimate debts of which were under £4,000—had cost no less than £6,750.

Apart from the costly process of winding up joint stock companies, it is not encouraging to promoters of new telegraph lines to find that, with scarcely an exception, shareholders of every new company that has been promoted for Atlantic cables, have had either to pass through this ordeal, or to endure the mortification of finding their shares unsaleable, or at a very heavy discount. The application made to the Vice-Chancellor in the case of the British United American Telegraph Company, was to compel the directors to refund to the shareholders the sum of about £25,000, alleged to have been lost to the company through a breach of trust committed by them in entering into fictitious transactions, for the purpose of obtaining a settling day for the shares of the company. The promoter of the company, it appears, claimed £7,000 for his services in connection with floating the concern. This claim has been compromised; but the Vice-Chancellor expressed his opinion that, under the circumstances, "the claim was an improper one, and ought never to have been sanctioned."

With respect to the light cable, the prospectus of which was referred to by us in our last, some further correspondence has taken place during the week. Sir James Anderson, who has had practical experience in laying and in fishing up cables in the Atlantic, states that he is in communication with the most distinguished electricians, who state that the proposed cable offers no advantages in signaling which the existing cables do not possess. He states that several light cables have already been laid and failed, and adds:

"Fifteen million pounds sterling at least have been expended by the British public to test this question; and it ought not to be expected that the same public will now be eager to offer more money to the same men, who have hitherto advised the existing type of cables, for the purpose of making an experiment for which they give no reasons. It is no longer a scientific speculation, but a matter of observation and actual handling of results."—*The Railway News.*

Why term the girls the "weaker sex?"
(A foul aspersion, foully made.)
Wait till they work the Stearns' Duplex;
We'll call them then the "sterner grade."

THE SWITCH.

Of all animals we dread a *bull* the most.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Closing Days of The Pacific and Atlantic Company at Pittsburg, Pa.

NEW YORK, March 3.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE a communication in your last issue in regard to the P. and A. "boys" of Pittsburg. I am not surprised to learn some of the "boys" got no work with the Western Union Company, knowing the way business was managed. When we heard the P. and A. Company was going where the "Woodbine twineth," and knew our "goose" was cooked, desiring to give the office a grand farewell, about one week before the office closed we decorated it with pine branches, and piled the chairs up so they touched the ceiling. Mr. Waters, manager, wishing to show his authority, etc., undertook to pull them down, when they all came on his head, lowering the crown of his high hat so that it cost him one dollar to have it repaired. The chairs falling on him held him in irons until he attracted the attention of people on the street, and they came in and relieved him from his "perilous" position. The "boys" raised a collection to have his hat repaired, but it was refused by Mr. Waters. I must say it was well the "boys" did get out of that old office when they did, or the "rats" would have carried some of them off, or they would have starved to death as they (the rats) took their lunches first every night. The night artists were allowed no extra time after two o'clock, and at twelve we would notify the different offices and make a march on the rats—get the heads of them and hang them on the "old man's desk," putting a notice on that we wished extra time for their heads. He only took it as a joke.

At Christmas we (the night artists) procured fire crackers, divided the force into sides and shot at each other until we had bought all the fire crackers that could be procured on Fifth Avenue. Some of the "boys" were absent the next day, giving as an excuse that they were sick. We were defeated the last night, as they moved the office a day earlier than we had expected, and we did not have the fun anticipated. While I was in the employ of that company I had a grand time. The managers, Mr. Hamilton and Mr. Prescott—the former day, latter night manager—were liked by all who worked in the office. I must now close with a few words to the men who were thrown out of work by Mr. Orton's letter, in which it was stated that we would all continue working for the Western Union Company, and then they only gave those that were thrown out a day's notice. I ask them never to enter into the service of the Western Union Company, as they treated them all too mean to ever have a favor done by any for them. H.

A Telegraphic Organization Essential to the Welfare of the Fraternity.

PHILADELPHIA, March 2.

TO THE EDITOR OF THE TELEGRAPHER.

THE article in your last issue signed "Don Juan" calls forth, for nearly the first time, a few feeble remarks from this section. The views entertained and the ideas expressed with reference to a Telegraphers' National Association, are so near in accordance with my own that I cannot refrain from giving vent to my feelings. That something of the kind at this present day is quite essential to the interests of telegraphers cannot be questioned. Not only will it serve to bring the operators into closer and more intimate relation with each other, but will (as "Don Juan" has so wisely remarked) protect them against the aggravated oppressions of petty employers. We do not wish to convey the idea that we would agitate and carry on strikes and all that sort of thing. No, we do not favor such moves, for we have learned by observation that in nine cases out of ten naught but evil results from them. We would have an easier and safer channel through which to protect ourselves than this. At the present time it seems to me that operators are working against each other instead of uniting together as we should. Had we an organization with unanimity of action, by which all could respond as the voice of one man, and each be brought to feel an interest in the welfare of his fellow operator as well as his own, we could go forth into the world with more pride in our occupation, and the insults and oppressions we are now compelled to endure would soon, and quite soon, be lessened.

I wish to disclose a few facts as they appear in their true light, by which the readers of THE TELEGRAPHER can form a faint idea how business is conducted on railroad telegraph lines. It should be, and I think is, as far as my experience has taught me, a rule with rail-

road companies to place operators in a line of promotion, and let them receive the same as soon as entitled to it, and as far as their qualification and merit will warrant; but on the line of some railroads there seems to be an entirely different system. Some time ago a man representing himself as E. S. H., *alias* something else, made application to the Superintendent of an important railroad line for a situation, and, to the certain knowledge of every one on the line, there was not a single vacancy of any kind; but he was one of those jolly, good natured sort of fellows—more so at certain times, perhaps, than others. One of those men that had been around considerable, and scoured more than twenty-nine different States in the Union, and a man that could hold more tanglefoot whiskey without spilling it than any one perhaps you ever saw. But a short sojourn in some of the Western States, where the women's temperance movement was being pretty vigorously pushed, had changed his views somewhat in regard to using it any more as a beverage; and having made this fact known, the Superintendent resolved to employ him, providing he was just as good as when they worked together in New York. A few moments in the operator's chair, and those gilt edged copies he turned out removed all doubt as to his ability. So he was employed to do nothing, at a salary of sixty dollars per month, and the Superintendent thought in a short time he could give him the general office as chief operator. Now all this time there were men on the line who had proven by their merit to be worthy and reliable, and who were kept working at salaries from thirty-five to fifty-five dollars per month. This star of the East continued to shine out brightly for a while, but at last it disappeared suddenly from our vision and was seen no more.

Another instance of a similar character occurred only a week or so ago.

The general office on this line became vacant, and, instead of promoting one of his own men to it, an entire stranger was employed—a man, perhaps, who had never heard of or knew there was such a line.

This will give a pretty correct idea of the manner in which business is conducted on that and some other roads. And yet with all this the Superintendent is an honorable man (?). When will such evils as this have an end?

Brothers, it remains for us to decide whether we will remain under bondage any longer or not. Let us arise from our lethargy and burst the bonds which so oppressingly bind us. To effect this we must work—work and faint not. Here is the point upon which our interests chiefly depend. The question now remains for us to answer, will we take such steps as are necessary to defend them or not? CROTZER.

The Telegraphs and Telegraphers of Washington Territory.

TENINO, WASHINGTON TERRITORY, Feb. 2.

TO THE EDITOR OF THE TELEGRAPHER.

THIS distant section of Uncle Sam's territory is connected by the wires of the Western Union Telegraph Company with Portland, Oregon, *via* Kalama and Tacoma, to Seattle, Washington Territory. At Seattle, the repeating is done for the Western Union line to Victoria, British Columbia, and also for the Puget Sound line. A branch line extends from Tenino to Olympia and Steilacoom, and a railroad telegraph line belonging to the Northern Pacific Railroad, extends from Kalama to Tacoma.

The timber generally is very dense, and tree falls and troublesome "grounds" are very frequent. The winter season is almost a continued drizzling rain—not cold nor very unpleasant, but "rough" on the wires.

As business does not keep the lines very busy we have plenty of time and opportunity to chat with each other over the wires, and nearly all the operators are personally acquainted, and all are on the best of terms with each other. The operators are a jolly, though very gentlemanly set of fellows; a force which any superintendent might feel honored to have under his charge.

The hard times affect us out here somewhat, but salaries on the railroad have not been reduced any as yet. Those, however, who were anticipating an advance now look upon such a thing as improbable. Mr. F. H. Lamb has been our Superintendent, but recently started for the East. Of courteous address and pleasant manners, he is a true gentleman, whom we disliked to part with. Superintendent Plummer, of the Oregon Division, who succeeds him, is said to be an efficient business man, whose *forte* is low wages and cutting expenses.

Mr. J. B. Whittlesey, one of the old timers, has been appointed railroad operator at Tacoma, the coming city.

Query? At the present rate of progress, how long before San Francisco becomes a suburb?

Your correspondent, Webfoot (an old personal friend), in company with Mr. Sheridan, of Albany, Oregon, W. U. office, paid us a flying visit a few weeks since.

I will crack a joke or two and then subside for the

present. Our worthy Superintendent is a star receiver, but his sending makes the shade of Morse quake in its quiet repose, if well meaning spirits are really cognizant of things sublunary.

He was sending slowly, and quite plainly for him, to "D," who did not know who it was. An impatient break and "Can't you write plain?" came in very indignant tones.

"I call that plain, and if you can't read it you had better wax your ears," was the response. Poor "D" subsided, while there was many a snicker behind the curtains, for how many had longed to say the same, but did not dare. We can't complain of F., though he did get "two good axes," "two foot axes." Guess it was H.'s sending.

"W." is generally there with O. K., but accidents will happen. In report he broke on: "She lost a hundred and four children," "g. a. lost." "Lost a husband an—" "Now stop this joking. Do you think a woman could lose a hundred and four children?" "She was a Mormon," chips in some reprobate.

How is it a man can't make a blunder but all hear, while ordinarily they do not listen. I know when first commencing to frighten Morse, the Superintendent told me I was worse than a wooden man. From the inquiries about that *chip*, I know every man on the line heard it.

It will sound better for some one else to relate my adventure with Miss Emma Lawrence. Probably Webfoot has already done so.

In a few months I will retire to the calm and rustic beauty of a farm in Iowa, and instead of rasping others' nerves with my lightning jerking, will reap turnips, plough wheat and thresh potatoes in quiet, under my own sunflower and basswood tree.

Then will no more be heard the sig. on the line of H., No.

The Demise of the P. & A. Lines, and the Consequent Telegraph Changes.—The Telegraph School Swindle.

PHILADELPHIA, PA., Feb. 24.

TO THE EDITOR OF THE TELEGRAPHER.

I SHOULD have sent you some account of the changes which have taken place in telegraphic arrangements consequent upon the absorption of the Pacific and Atlantic wires into the main office of the great telegraph corporation, the Western Union Telegraph Company, on the corner of Third and Chestnut streets, but for the fact that my time has been so fully occupied.

The main office of the Pacific and Atlantic Company, which has been so long located at No. 303 Chestnut street, was finally closed up on and after the 1st of January, the wires taken into the Western Union office, and the competing company, which at one time was so baughty and self-sufficient in its management, and from which so much was anticipated in its earlier days, ceased to exist as a practical telegraphic organization. It was high time that something was done with this concern, as latterly, during its existence, it was a miserable apology for a telegraph company.

Feeble and impecunious through bad management, and the impracticable character of those who were supposed to control it, it had become a telegraphic nuisance, and the sooner it was out of the way the better.

The operators formerly in the employ of the P. and A. Company, with the exception of four, were given positions with the Western Union Company. Mr. J. M. Sailer, the receiver at 303 Chestnut street, has been employed as receiver for the Franklin Company, at the main office on the northeast corner of Third and Chestnut streets. Mr. R. J. Wynne, formerly chief operator of the P. and A., has been employed as operator by the Franklin Co.; and Mr. W. J. Burt has accepted a position as operator at the Philadelphia, Reading and Pottsville Company's branch office.

The closing up of the P. and A. office has given considerable strength to the Franklin lines, and a prosperous future may be predicted for the latter company.

The patrons of the telegraph in this city are very much displeased with an order just issued by the Western Union Company, to the effect that persons doing business with them, and not having *charged* accounts, shall be required to pay cash for any night or half rate messages they may desire to send.

The Philadelphia, Reading and Pottsville Telegraph Company, which occupied the office 303 Chestnut street jointly with the P. and A. Co., have moved their wires formerly connecting with the latter company into that of the Franklin Company on the northeast corner of Third and Chestnut streets, until the completion of the new office which is being prepared for them, and which is expected to be ready about the middle of March.

The Automatic Telegraph Company have rented the basement floor of the new building No. 310 Chestnut street, and moved into their new quarters on the 10th instant. This company is doing quite a good share of

the business, their rates being 25 cents for twenty words. The inquiry is frequently made for "the company that sends twenty words for a quarter."

There is a plug factory in full blast here, which does business on a large scale, and promises to turn out two operators (?) a year. Notwithstanding that the fact is well known that there is now a surplus of operators, which is not likely to be diminished for some time to come, these so-called telegraph schools, institutes and colleges succeed in deluding many unsophisticated victims into believing that they have only to go through their mill to insure them speedy, pleasant and profitable employment! Verily, the fools are not all dead yet, as these novices find out when their money is spent, and they seek to turn their dearly bought instruction to advantage. W.

Nettie Bronson and "The Telegrapher" Correspondents.

TO THE EDITOR OF THE TELEGRAPHER.

IT pleased me so much when I read that communication from "Elias." The idea! to think that I am an old maid of thirty-five, and must be wanting to get married! If I was as old as that no doubt but what I should be looking around for a man. But, if you please, "Elias," I would never hunt for a husband through the columns of a paper. I don't think one who considers herself a lady would wish to correspond with a married man. This city has plenty of young men, and good ones too, without going further for them.

I did not intend to give any one the thought when I wrote that article of January 24th that I wished any person to send me the paper. I thank "Elias" for his kindness in wanting me to receive the paper, and that he would be one of the donors; but a thousand thanks to "Silver State," who sent two dollars to renew my subscription. I am very glad that I am again able to peruse its interesting columns, and shall welcome it each week—often thinking of the generosity of "Silver State."

I am sorry that "Jennie" has given up the idea of obtaining my address. Would gladly answer her letters, and am not at all partial to the male sex in regard to correspondence. NETTIE BRONSON.

A Scientific and Practical Problem.

TO THE EDITOR OF THE TELEGRAPHER.

WILL C. C. H. and other eminent electricians consider this worth their attention? Cannot relays be made with extra coils removable at pleasure, that the operator may have instruments of large or small resistance, according to condition of the line to be worked? H. No.

"Agitator" Snubbed.

TO THE EDITOR OF THE TELEGRAPHER.

KINDLY request your correspondent, "Agitator," to view himself in a mirror. He will certainly see two elongated auriform appendages on the sides of his head. SOOTHER.

A Good Hit.

SCENE—Near switch board; time, 12.30 P. M.

Dramatis Personæ—Chief Operator and Night Man.

C. O.—"Who cut out last night?"
N. M.—"I suppose I did."
C. O.—"At what time?"
N. M.—"When I got 30."
C. O.—"Well, you left two lines open by putting the plugs in the wrong places."
N. M.—"Oh, I have often seen plugs where they shouldn't be."

The Pima Indians and the Telegraph.

CAPTAIN PRICE tells a good story about the Pima Indians and the Arizona Telegraph. The line runs directly through the villages of the Pimas, passing over their houses. It appears that these well disposed Indians have suffered in their farming operations for want of rain, and in some way they became possessed of the notion that the telegraph wire was a mysterious device of the Americans to bring rain, and watched its building with corresponding satisfaction. Sure enough, bountiful rains descended soon after the completion of the line, and the Pimas were happy. But the heavy storm in the latter part of January was too much for them, and the floods threatened to drown them out. The obvious remedy was to pull down the wires and stop the rain, and the Indians, with the best intentions in the world, proceeded to apply it. Sure enough, the storm ceased just at that time, and this served to confirm the innocent people in their idea of the use of the telegraph. Capt. Price says it was useless to try to explain the matter, or reason with them; and it required some pretty sharp talk to the head men to make them understand that their people must let the wire alone.—*The San Diego (Cal.) Union.*

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, MARCH 14, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,
AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of **THE TELEGRAPHER** will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The TENTH VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the

TELEGRAPHIC FRATERNITY,

whose organ it is and will continue to be. It is a thoroughly

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bound to, or in the interests of NO TELEGRAPHIC CLIQUE OR COMBINATION, but honestly devoted to the interests of the

PRACTICAL TELEGRAPHERS.

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Advertisements are solicited, and will be inserted at reasonable rates; but no Advertisement will be inserted for less than ONE DOLLAR per insertion.

All communications relating to or intended for THE TELEGRAPHER must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503.) NEW YORK.

The Demand for The Telegrapher.—Back Numbers Wanted.

We have endeavored to print enough of each number of the present volume of THE TELEGRAPHER to supply all who may wish to commence the volume with the back numbers through the year, and supposed we had done so. It turns out, however, that the demand has been so much in excess of our calculation that one number is entirely exhausted and another nearly so. Of the rest we have a pretty good supply. It sometimes happens that the demand for certain numbers will be unexpectedly large, and the consequence is that the ordinary edition, or that which had been printed in anticipation of such demand, is insufficient. We are entirely out of No. 391, for January 10, and nearly out of No. 392, for January 17, of the current volume. Our friends who may have copies of either or both these numbers on hand, which they do not care to retain, will confer a very great favor upon us if they will return them to this office, and one which will be gratefully appreciated.

The Present Condition of Telegraphs, Telegraphers and Telegraphic Service.

THE existing condition of the telegraphs, telegraphers and the telegraphic service in this country, and their relations one to the other, deserves, and should receive careful consideration from all who are interested therein. In the last number of THE TELEGRAPHER we spoke of the telegraphic projects at home and abroad, and in another article gave some facts in regard to the excess of telegraphic labor at the present time over the demand, which leads us naturally and logically to the further consideration of the subject which we propose to briefly discuss in the present article.

As has already been shown, the telegraph business at the present time is passing through a season of dulness and depression such as it has not experienced for many years. This arises, of course, from the depression which exists in business generally, and the hesitancy of people to engage in active and extensive business operations while doubt and uncertainty continue as to the financial policy of the future. The panic of last fall, and the losses and suffering which have resulted from it, have made capitalists and business men cautious and economical, and the anticipations of a speedy revival of business generally have not, as yet, been realized. There is a disinclination especially to engage in new enterprises, which involve the investment of a considerable amount of capital, and business men are inclined to wait further developments before making any important move in any direction. Money at the financial centres is in excessive supply, and seeking employment at almost nominal rates, and large amounts are practically lying idle in this city, which ordinarily would stimulate enterprise and speculation. It is not so at the present time, however, and the telegraph business is depressed in consequence.

How long this condition of things will continue it is, of course, impossible to predict. It does not seem probable, however, that it can continue for very long, but the present indications are that there will not be the ordinary amount of business doing the present season.

The effect upon the telegraphic fraternity is, of course, to reduce the demand for their services, and render it difficult to obtain situations by those who chance to be unemployed. We do not learn of any proposition for a reduction of compensation, and if the situation should become no worse, there is not likely to be any attempt to effect a general reduction. Telegraphers should pursue a conservative policy, and should not become impatient, even if they do not realize all their expectations and desires as regards situations and remuneration. They should do their duty cheerfully and faithfully, and await developments, as most others are now compelled to do. Nothing is to be gained by a contrary

course; and whatever may be the ills they now have to endure, they cannot be improved by flying to others that they know not of.

We do not write this on account of any manifestation of a disposition on the part of the fraternity to make antagonistic demonstrations. On the contrary, there has been very little indication of united or effective action on their part for a long time. It is true that our correspondents occasionally discuss the desirability and importance of a telegraphic association or organization, but the discussion does not seem to result in any very considerable movement of the telegraphic waters. We believe that such an association is desirable, and, properly organized and conducted, would be of great value and importance. That it will be effected in time we think probable, but for the present it may be considered as not likely to be brought about. In the meantime the continued discussion of the subject can do no harm, and in the columns of THE TELEGRAPHER the views of all parties may be presented for the consideration of the fraternity.

The condition of the telegraphic service has been pretty well indicated in what we have here set forth. It does not offer inducements at present for large accessions to the telegraphic ranks, and the deluded victims of the telegraph schools, so-called, which are already in existence, and which are springing up all over the country, are likely to find out the truth of the saying that "a fool and his (or her) money are soon parted." They are paying out their money for that which, even if it were what is promised them, would at the present time be of little value to them. When the supply of telegraphic labor is so much in excess of the demand it is the height of folly to still further crowd the ranks. We speak in this matter more in the interest of the victims of these plug factories than of the telegraphic fraternity, as so few of the former ever succeed in obtaining a foothold in the business, and those who do find it necessary to serve a second apprenticeship in a regular telegraph office before they become competent to discharge the duties of an operator.

Upon the whole, while we do not see any very special encouraging outlook in the immediate telegraphic future, we do not think that the present situation is likely to become permanent. There will be at no very distant day a revival of business, and telegraphy with the rest. We must wait patiently for the good time coming, and in the meantime, by economy, diligence, and faithfulness, make the best of things as they are.

Literature.

The International Review. March, 1874. New York: A. S. BARNES & Co.

THE March number of this review contains several articles of great value and interest upon current topics, among the most noticeable of which is a paper by Professor J. E. HILGARD, of the Coast Survey Service, upon the approaching transit of Venus, which will occur on the 8th of December, 1874. Professor HILGARD explains with great clearness the methods which are to be employed by the different observers stationed at various points in the southern hemisphere, by means of which the true distance between the earth and the sun will unquestionably be determined with far greater accuracy than has heretofore been possible. The importance of this determination arises from the fact that it is really our fundamental unit of measure for all the celestial spaces. As an illustration of the accuracy with which these measurements are carried out by modern observers and modern methods and apparatus, Professor HILGARD states that the polar diameter of the earth, of some 8,000 miles, is certainly known within a limit of error of thirty yards! A new method of measurement, far superior to any former one, will be employed on the present occasion—that of photographing the different stages of the phenomenon, and then making the measurements and calculations from the photographic plate itself. The paper is of great interest and will well repay perusal.

The Illustrated Annual of Phrenology and Physiognomy, 1874.
S. R. WELLS, New York.

This handsomely printed and beautifully illustrated annual fully maintains the well established reputation of its publisher. Every person will find something in its pages that will be of interest and benefit to them. It can truly be said of Mr. WELLS, that every publication issued by him is intended to make the world better, healthier and happier. We trust that the number of his readers may increase and multiply. The price of the annual is only twenty-five cents, and it is well worth the money.

Annual Announcement of Packard's Business College, 805 Broadway, New York. 1874.

The pamphlet announcements of educational institutions are usually very dry reading, but the present one is a conspicuous exception. Mr. PACKARD is one of the most intelligent, progressive and common sense men of whom we have any knowledge, and his "Business College" has, as a necessary consequence, become a distinguished success. We wish that every young man and young woman could have a copy of this pamphlet—probably Mr. PACKARD will send it on application—and read, mark, learn and inwardly digest the principles of business success contained in its pages, as expounded by Dr. BELLOWS, HORACE GREENE, PETER COOPER, ELIHU BURRITT, S. S. RANDALL, and many others—men who have been successful themselves, because they were honest, upright, industrious and energetic. No young person can read the addresses of these distinguished men, as given in this little volume, without feeling a renewed inspiration to be true to themselves and the right, as the only path to permanent success and happiness. In his address to the graduating class in 1872, ELIHU BURRITT said: "It is because I believe that this College teaches and promotes this higher law of commerce, that I have come from another State to testify to its value. If its aims, and ends, and influences were merely to issue in the training of young men in the adroit art of unscrupulous money making, I would not have gone ten rods to attend its anniversary."

A New Style of Telegraphic Journalism.

We have received copies of two papers which have been started by operators in the office of the Western Union Telegraph Company at Chicago, Ill., which inaugurate a new style of telegraphic journalism. One is entitled *The Switch*, and was the first to make its appearance, and the other *The Fraternity*. *The Switch* is a seven by twelve inch paper, and is published by Mr. WM. WALLACE, Jr., and we understand is to be edited by Mr. FRANCIS. Subscription, 40 cents per month. *The Fraternity* is somewhat more pretentious, being about twelve by nineteen inches in size, and bears the name of Mr. J. W. STRONG as editor and proprietor, and is published at 275 West Monroe street. The subscription price of the latter is put at \$2 per year; single copies ten cents.

These journals are local in their contents and make up, and we have no doubt but that they will for the time amuse those for whom they are designed. They do not aspire to a high standard of journalistic ability, and the contents are especially made up of personals and matters concerning the Western Union offices and employes in the city where they appear. They have inaugurated their enterprises with what appears to be a violent rivalry and antagonism, but this may be a shrewd but not novel dodge to excite an interest and induce a demand for the publications among their associates.

We understand that a similar publication has been commenced in this city, but have not, as yet, been favored with a copy. It is very probable that there may be an epidemic of this kind of telegraphic literature for a time, as every place of any considerable size can thus have its own telegraphic organ. They all have our best wishes for their success, but to attain it and make it permanent they will find that hard work, patience and perseverance will be requisite.

Elementary Principles of Electrical Measurement.

THE continuation of Mr. POPE's articles on the above subject has been unavoidably delayed in consequence of his absence from the city, but will probably be resumed in our next issue. We are receiving many letters testifying to the exceeding clearness and great theoretical and practical value of these papers, and although the author's business engagements are such as to render it impossible for him to furnish the articles with entire regularity at all times, yet it is not probable that any serious delay will occur in their publication. The revision of the matter and the preparation of the engravings renders the personal supervision of the author very desirable, if not absolutely indispensable, and it is for this reason that delays may occasionally happen in the publication of the series.

Brooks Insulators.

WE would invite the attention of telegraphic managers and superintendents to the advertisement of Mr. BROOKS, which appears in another column, and will be found interesting reading for practical telegraphers. So far as we can learn it is pronounced a practically perfect insulator by all of the hundreds that have used it during the past six years. The improvement of line insulation is the very foundation and corner stone of all progress in practical telegraphy, and the absurdity of our leading telegraph company in repeating the English blunder of erecting extra heavy and expensive wires, with the necessary accompaniments of proportionately heavy and costly poles, in order to be able to use cheap insulators at a saving of about five dollars per mile, is so glaring as to be almost beyond criticism. Mr. BROOKS makes a rather unique challenge at the end of his advertisement, and we really wish somebody would publicly take him up on it. An insulator that will enable a No. 9 wire to be worked at full speed through a direct circuit of 1,000 miles better than a No. 5 wire on the same set of poles insulated with any of its rivals, certainly ought to make its way in the world. Mr. BROOKS claims that attempts have been made to depreciate the value of his insulator by the publication of measurements of the old style of insulators made by him fifteen years ago, and totally unlike the modern one, and leaving the public to infer that such tests referred to the present insulator. It is not probable, however, that the ultimate success of a valuable invention will be prevented by any possible misrepresentation. Mr. BROOKS ought to remember that the most clubs and stones are thrown at the trees bearing the best apples, and keep on making, advertising and selling insulators. Insulators appear to be his forte, as Artemus used to put it, and he has certainly attained a wonderful degree of perfection in their manufacture.

Important to Telegraph Instrument Makers.

THE attention of telegraph instrument makers is called to the advertisement in another column of the Canadian Telegraph Supply Manufacturing Company, of Toronto, Canada. This is a good opportunity for first class workmen to obtain permanent employment with a reliable company, which is doing an extensive and profitable business.

The Telegraphers' Mutual Benefit Association.

A DESIRE having been expressed by many subscribers to THE TELEGRAPHER that the assessments and acknowledgments of the Telegraphers' Mutual Benefit Association should be published in this paper, we shall for the future print them regularly.

The following are the first assessments which have been made for over three months. Others will appear next week.

After the lapse of over three months notification has been received of the deaths of three members of the Association, two of whom have been connected with it since the first few months of its existence. A triple assessment is thus rendered necessary, and has been issued. The following are the deaths reported, and

which will be covered by assessments Nos. 55, 56 and 57:

J. M. Worden (certificate No. 330, issued Oct. 6, 1868), died Feb. 8, 1874, at Oxford, Ala., of congestion of the lungs.

F. E. Curtis (certificate No. 1,363, issued Jan. 19, 1872), died Feb. 11, 1874, at Springfield, Mass., of apoplexy.

Gilbert M. Simmons (certificate No. 111, issued Nov. 15, 1867), died Feb. 12, 1874, at Williamsburgh, N. Y., of heart disease.

Members holding certificates numbered up to and including No. 2,152 will remit for assessments 55, 56 and 57; those holding certificates numbered from 2,153 to 2,200, inclusive, will remit for assessments 56 and 57. Members restored by "Resolution of Nov. 5" are assessed for 55, 56 and 57.

The following circular has been issued to the members:

"At the Annual Meeting of the Association, in November last, resolutions were adopted establishing

"1. That a member in default sixty days after any assessment forfeited membership.

"2. That restoration could only be effected after application as at the first, the payment of back dues, and a second admission fee of one dollar and a half.

"The Executive Committee, whose duty it is to protect the Association from harm, are apprehensive that the obligation to pay the second admission fee is operating so as to prevent the restoration of many valuable members, who feel it oppressive. They do not complain, but they do not return, as, we think, many would were this exaction removed. I have been instructed to advise you of our apprehensions in this matter, and ask your opinion thereon. Very truly yours,

"JAMES D. REID,
"Treasurer."

Personals.

Mr. W. CULLEN has resigned the situation as night manager of the Dominion Telegraph Company at Toronto, Canada, and accepted a position on the day force of the Montreal Telegraph Co., Toronto.

Mr. MULLEN has been appointed night manager of the Dominion Telegraph Co., at Toronto, Canada.

Mr. R. MERRIFIELD has been transferred from the Buffalo, N. Y., to the London, Canada, Dominion Telegraph office.

Mr. D. L. WILSON has been transferred from the Toronto, Canada, to the Buffalo, N. Y., office of the Dominion Telegraph Co.

Mr. E. M. MARSHALL has been appointed telegraph operator at Beauventura, Canada, station of the Grand Trunk Railroad, the duties at that station having increased very much of late, rendering an increase of the operating force necessary.

Mr. WOOD has been appointed to take charge at Dickinson's Landing, G. T. R., at night.

Mr. BOYD has been promoted to the Brockville office of the G. T. R.

Mr. WALLIS, late of Lachine branch office, has been promoted to the agency of Kingston Mills Station, G. T. R.

Mr. HEAGENS, late of the Montreal Telegraph Co., has accepted a situation with the G. T. R. at Lyn, Ontario, Canada.

Mr. MCGAUGHEY, of Ewestown Station, G. T. R., has resigned and engaged in other business.

Mr. D. H. ELLIOTT, operator at the Kingston, Ontario, office of the Montreal Telegraph Co., who was obliged to give up work through severe illness, is now quite restored to health again.

Mr. BURBRIDGE, of the train despatcher's office, Island Pond, G. T. R., has resigned, and accepted a position in the night office, Collins' Bay, of the same road.

Mr. R. B. PEARSON, late superintendent of the Pacific and Atlantic Telegraph Co. at Chicago, Ill., has accepted a position on the regular day force of the Western Union office of that city.

Mr. JOHN F. STEVELY, late manager of the P. and A. Co. at Chicago, Ill., has accepted a position on the day force in the Western Union office in that city.

Miss ANNIE F. VEAZEY has accepted a position on the operating force of the Western Union Co. at Chicago, Ill.

The screw steamer Ambassador, having on board 538 knots of telegraph cable, recently sailed on her way to Brazil. The cable forms part of that contracted for by Messrs. Siemens Brothers for the Platino-Brazilian Telegraph Company, to connect Rio de Janeiro with Uruguay.

The Telegraph.

Foreign Telegraphic Notes.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended February 14, 1874, was 352,426—an increase on the corresponding week of last year of 59,979.

The Eastern Telegraph Company (Limited) have notified that their cable between Vigo and Lisbon, as well as the direct Portuguese line, being interrupted, messages for Malta, Egypt and the East will for the present be forwarded *via* Marseilles, and that, should there be any delay on this route, messages for India and places beyond India will be handed over to the Indo-European Company for transmission *via* Teheran. The company's repairing ship will proceed to sea at once to restore the lines which are now interrupted.

A circular has been issued by some of the shareholders in the Cuba Submarine Telegraph Company, recommending the amalgamation of the undertaking with that of the West India and Panama Company.

A new steamer called the Paraday, specially constructed for laying ocean cables, has been launched from the works of Messrs. Mitchell & Co., of Newcastle-on-Tyne. The vessel has been built to the order of Messrs. Siemens Brothers, of London, for the purpose of laying their Atlantic cables. The Paraday is 360 feet long, 52 feet beam, 36 feet deep, and measures about 5,000 tons gross register. She will, however, carry about 6,000 tons dead weight.

The subject of telegraphic extension and communication with the other Australian colonies and with Europe, was brought under the notice of the Legislative Council of Western Australia, at a special session held in November last. A resolution submitted by the Colonial Secretary, affirming the desirability of such communication with Adelaide, *via* Eucla and urging the Government to lay definite proposals on the subject before the Council for consideration at its next session, was passed.

Electric Railroad Crossing Alarm.

The bell placed on the Pennsylvania road at the South street depot on trial has thus far proved a success. It is a large gong, placed on a post near the crossing, and is connected by wires to a galvanic battery, and to one of the steel rails in the track, about one thousand feet from the depot. The bell sounds the alarm the moment the train strikes the rail to which it is attached. The sound of this bell can be heard at a distance of a quarter of a mile. This novel way of "flagging" a crossing has attracted considerable attention, and all who have seen it say it works like a charm, and is, beyond a doubt, a good and cheap flagman.—*The Elizabeth (N. J.) Daily Journal.*

New Patents.

For the week ending January 27, 1874, and bearing that date.

No. 146,758.—ELECTRIC ANNUNCIATOR.—Louis Finger, Melrose, Mass. Application filed February 1, 1873.

A cylinder, upon which various wants are indicated, is revolved by clock work, controlled by an electro-magnet, till proper order is displayed at an opening in outer case. Caller has a series of inclined pivoted levers caused to close a circuit by tilting. A hall, introduced into an aperture opposite the article called for, runs over a series of the levers, closing circuit proper number of times to cause the cylinder to be revolved and show name of article desired.

1. In an annunciator, the combination of a series of inclined planes or levers, circuit closers controlled by the passage of a weight or hall from one plane or lever to another, and of the mechanism for operating the alarm and indicating cylinder, substantially as described.
2. The ratchet sector *o*, connected by the lever arm *o'* to a shaft *h*, and depressed by a spring *p'*, in combination with the train *g m'* the latter operating the indicating cylinder of an annunciator, substantially as described.
3. The cam or escape wheel *q*, held and released by the lever *r r'*, armature *t*, magnet *u u'*, in combination with train *g m* of the indicating cylinder, substantially as and for the purpose specified.
4. The combination of the ratchet sector *o*, constructed as described, with the arm *i* and lever *k*, for carrying the indicating cylinder back to its original position, substantially as described.
5. The wheel or disk *a''*, of insulating material, provided with a metallic conducting piece *b''*, in combination with the metallic spring *c'* bearing on its surface, said spring being connected with a battery operating an electro-magnet *d''*, and armature *e''*, by which a bell or gong is struck at every contact of the piece *b''* and spring *c'*, substantially as described.
6. The face of the collar of an annunciator, having apertures *C C'* and receptacles *M M'*, arranged to receive a device for operating a circuit closer, substantially as specified.
7. Inclined planes *D''*, arranged at the bottom of a caller, and meeting at the centre, and sloping inward to direct a hall or other movable body through the aperture *C'* into the receptacle *M'*, substantially as specified.
8. A caller of an electro-magnetic annunciator, having apertures *C C'*, properly designated by the name of the article or person desired, and provided with suitable cups or receptacles, *M M*, on the outside, and in the interior with inclined levers or planes *D D' D''*, all arranged and operating substantially as described.

Married.

WOOD—CROWLEY.—On Tuesday, February 15th, at the residence of the bride's father, Winnemucca, Nevada, by Judge O. R. Leonard, Mr. R. W. Wood, Manager of the Atlantic and Pacific Telegraph Company, to Miss MATTIE CROWLEY, all of that place.

Died.

CALKINS.—In Cleveland, Ohio, March 4th, GEORGE W. CALKINS, an operator for the Western Union Telegraph Company, at the Union Depot in that city.

BROOKS' PATENT INSULATOR.

WORKS, No. 22 SOUTH TWENTY-FIRST ST., PHILADELPHIA, PA.

The attention of those interested in the economy and efficiency of Telegraph Lines is called to the merits of this insulator. The following are among the advantages derived from its use: FIRST.—It is not affected by rain or damp weather—being the only insulator possessing this quality.

The direct advantages are the avoidance of error and delay in transmission consequent upon defective insulation. The indirect advantages refer to economical construction and maintenance.

When this insulator is used a No. 11 or 12 wire is ample, unless the circuit is extraordinary in length. A No. 12 steel or charcoal iron wire can be worked farther and better in every condition of weather than a No. 8 wire, such as usually employed on ordinary insulators. The expense of the No. 8 wire is fully double that of the No. 12. The other advantages of the smaller wire are: Less liability to break, from contraction by cold and other causes—less strain upon the posts and greater ease of splicing and manipulation. It enables an ordinary No. 9 wire to be worked a thousand miles in rain, at full speed and capacity, a condition not attained with ordinary insulators, even when a wire twice the size and costing nearly double is employed.

Over one hundred measurements of the resistance of the Prussian Insulator in rain, during the past six years at these works, as compared with the common glass insulators of this country, give an average result in favor of the former of over six to one. In Germany, where the Prussian Insulator is used, the wire most employed is only two and a half millimetres in diameter, or weighing less than one hundred and fifty pounds to the mile. As "the practical working value of a telegraph line is the margin between the joint resistance of the conductor and the insulation and that of the insulation alone," a wire upon the ordinary glass insulators of this country, would weigh equally well as the small wire upon Prussian Insulators, would have to weigh a thousand pounds per mile. The Patent Insulator exceeds the Prussian insulator as much as the Prussian does the common insulators of this country.

To railroad companies this insulation is of great importance, inasmuch as the resistance of the lines is generally greatly increased by intermediate relays, diminishing the margin or "practical working value." Lines of a hundred or more miles in length are worked in rain without inconvenience, where as many as thirty relays are in the circuit. Such circuits with ordinary insulators are little better than useless in rain; besides, it requires a much more skilful and expensive class of operators to work them, if worked at all. In cases where the common insulators are furnished railway companies by the telegraph company, free of cost, it is no economy to use them. The Patent Insulator has been adopted by the Pennsylvania Railroad, the Philadelphia and Reading, the Philadelphia and Erie, the Northern Central, the Lehigh Valley, the North Pennsylvania, Baltimore and Potomac, and other railway companies, to the exclusion of all other kinds. There is little or no breakage, thus avoiding the derangement of wires and expense of maintenance, owing to this cause.

GUARANTEES.—To enable a wire of a given size to be worked farther in rain at full speed and capacity than a wire of twice the

size placed on common glass insulators or the Kenosha insulator, or no pay. Wherever the glass or Kenosha insulators are used, the proprietor is ready to insulate parallel wires upon the foregoing specified conditions.

To enable a No. 9 wire to be worked at full Morse speed and capacity in a single circuit of a thousand miles in rain, and better than is possible with a No. 5 wire on the same set of poles, and insulated with the common glass or Kenosha insulator, those employing the larger wire can have the privilege of using as many repeaters as they please. No pay unless these conditions are fulfilled.

AGENCY FOR SIEMENS' GALVANOMETERS, RESISTANCE COILS, SUBMARINE CABLES, CABLES FOR RIVER CROSSINGS, POLARIZED RELAYS, INK RECORDERS, AND EVERY VARIETY OF ELECTRICAL APPARATUS MANUFACTURED BY THAT CELEBRATED FIRM.

PHILADELPHIA, March, 1874.

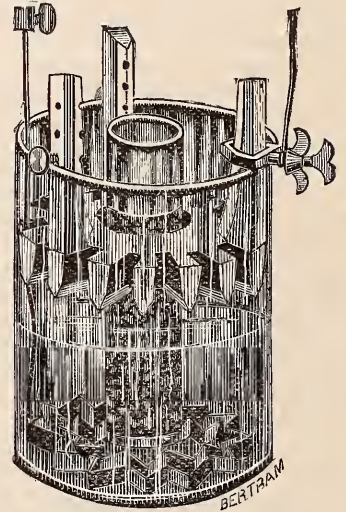
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FIRST CLASS TELEGRAPH INSTRUMENT MAKERS, to work by the piece. Only the most competent need apply, and must be well recommended. Compensation will be liberal and living is cheap.

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P. O. Box 1421.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

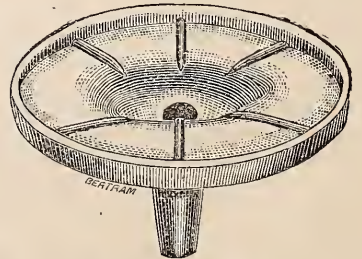
All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

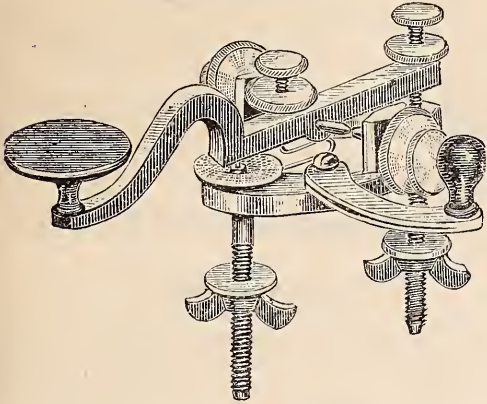
WATTS & CO., Baltimore, Md.

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NAME OF COMPANY.	MARCH 5.		MARCH 6.		MARCH 7.		MARCH 9.		MARCH 10.		MARCH 11.	
	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
Western Union.....	74½	73%	73½	72%	74½	71½	74½	73%	73½	73½	74	73%
Atlantic and Pacific.....	16%	16½	16½	16%	17	16%	17	17	17	17	17	17
American District.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Quotations of Telegraphic Stocks dealt in at the New York Stock Exchange.

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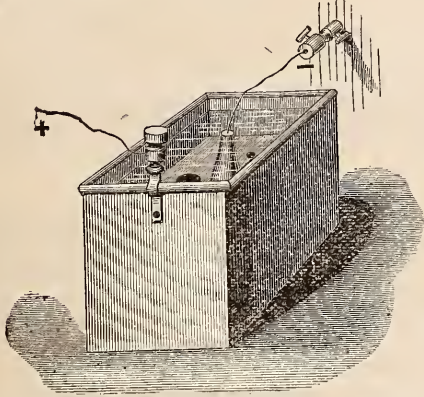
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.
On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.
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WE OFFER OUR CUSTOMERS THE BENEFITS OF THE RECENT REDUCTION

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IN

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WILL CONSULT THEIR OWN INTERESTS BY PURCHASING FROM US.

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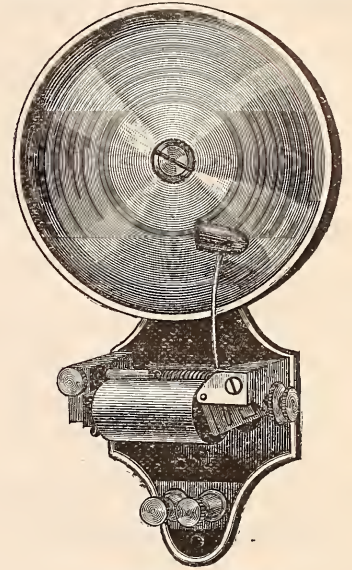
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- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3.....\$4 00
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Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

Special attention given to REPAIRS and MODEL WORK.

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One half of actual size

ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

- The Platina Points are large and hard.
- Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight.. \$50 00
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PATENT ELECTRIC WATCH-CLOCK THE BEST IN USE.

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Batteries of Every Description,

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MEDICAL BATTERIES FROM \$4 UPWARDS.

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THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
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SUPERIORITY, VALUE

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The Distinctive Features of these Systems of

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ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

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IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

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the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

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the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, THERE CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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TELEGRAPH ENGINEER,

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AND EVERY DESCRIPTION OF

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BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made.

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH
INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
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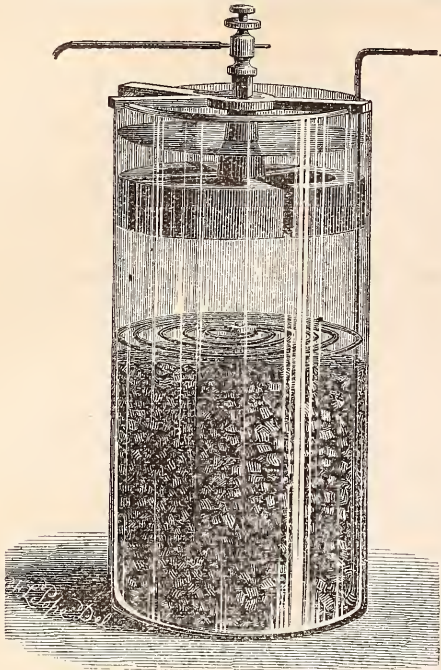
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So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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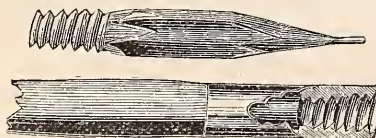
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The Telegrapher

A Journal of Electrical Progress.

Vol. X.

New York, Saturday, March 21, 1874.

Whole No. 401

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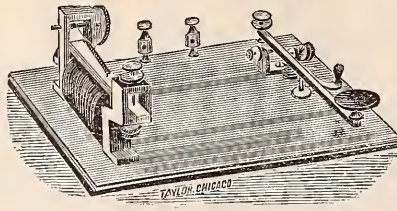
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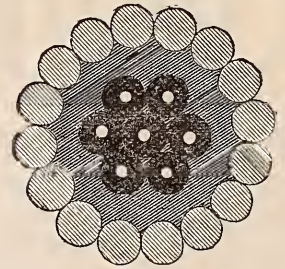
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MARCH 21, 1874.

VOL. X. WHOLE No. 401.

Original Article.

(Continued from page 43.)

Elementary Principles of Electrical Measurement.

BY F. L. POPE.

A GALVANOMETER so constructed that the mathematical tangents of the angles of its deflections are in all cases strictly proportional to the strength of the currents by which the deflections are produced, is called a *tangent galvanometer*. This effect is produced by so arranging the conducting wire relatively to the magnetized needle, that the current traversing the conductor will act uniformly upon the needle in whatever position it may place itself, or in the same manner that the earth's magnetism does.

The principle of the tangent galvanometer will readily be understood by a reference to the diagram (fig. 10).

Let *n s* represent a freely suspended magnetic needle, which has assumed its normal position in the line of the magnetic meridian *N S*, under the influence of the earth's magnetism. If now a conducting wire or

76° would be 4 nearly in the table of tangents, as we see by the diagram that it should be. It will also be noticed, by reference to the diagram, that for a distance of 14° or 15° from *N*, the line of tangents *N 4* is very nearly parallel to the arc *N B*, which is the reason why the deflections of a galvanometer are proportional to the currents producing them, when the angle of deflection does not exceed 14 or 15 degrees. A degree on the scale is here almost exactly equal to its tangent, but above 15° the tangents rapidly become greater and greater in proportion to the degrees, until the tangent

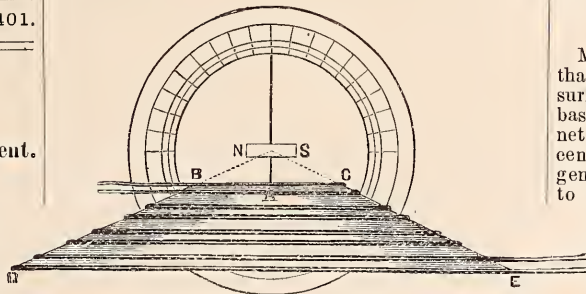


Fig. 11.

of 90°, represented by the line *A B*, is infinite, because it is in fact parallel to the line of tangents *N 4*. The conditions requisite in the construction of a true tangent galvanometer have already been referred to,

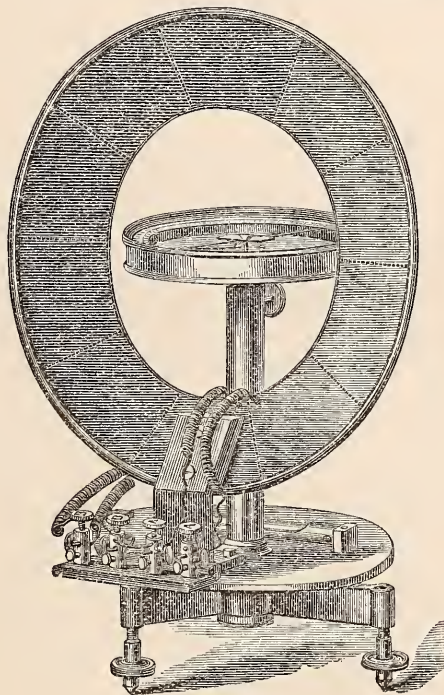


Fig. 12.

of wire placed in a vertical position, and having a short needle suspended precisely in the centre of the ring. To insure accuracy in the indications, it is necessary that the needle should be very short relatively to the diameter of the coil, and the shorter the needle in proportion to this diameter, the greater will be the accuracy of the instrument. It should not in any event be more than one sixth the diameter of the coil. The deflection is observed by means of a light aluminum pointer at right angles to the needle, which traverses the graduated scale. This form of galvanometer has been very extensively used.

Gaugain's "Tangent Multiplier."

M. Gaugain, a prominent French electrician, found that when the conducting wire is wound upon the surface of a frustrum of a cone, having the plane of its base parallel to the magnetic meridian, and the magnetic needle is suspended in such a manner that its centre coincides with the vertex of the cone, the tangents of the angles of deflection will be proportionate to the forces of the currents producing them. This theorem is correct to within $\frac{1}{1000}$ when the needle is from 1.17 in. to 1.36 ins. in length, and the diameter of the coil not less than thrice the length of the needle. The height of the cone must also be one fourth of the diameter of its base.

This arrangement is shown in figure 11, which is a plan view of the needle and coil of Gaugain's Multiplier. The needle *N S* is placed so that its centre coincides with the vertex of the cone *B C D E*, upon the surface of which the conducting wire is wound. Figure 12 is a perspective view of an instrument of this kind manufactured by Messrs. Knox & Shain of Philadelphia.

Gaugain's method of construction is a great improvement upon that of Weber in two respects; first, in the accuracy of its indications, and second, in the greater proximity of the coil to the needle upon which it acts, by which its sensitiveness is much increased. The difficulty which arises in the construction of this instrument, is in making the centre of the needle precisely coincident with the vertex of the cone, as the

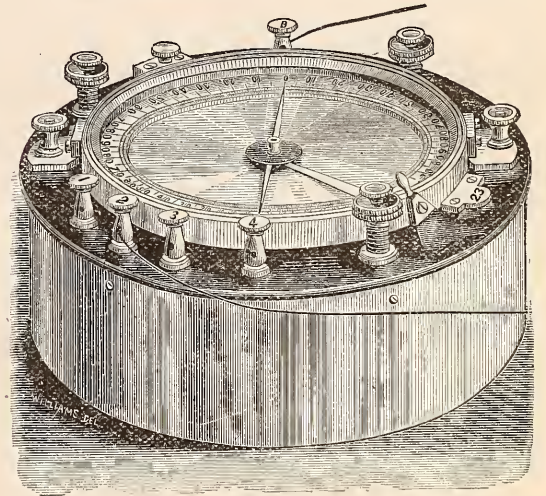


Fig. 14.

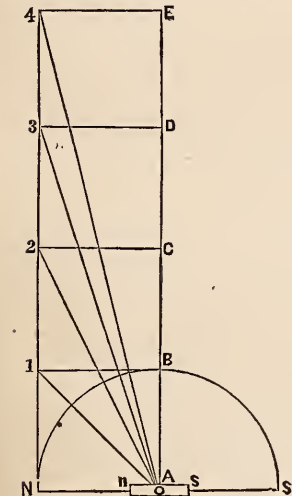


Fig. 10.

coil be placed in the plane of *N S*, so as to surround the needle, and this conductor be traversed by an electric current of such a strength as to produce an effect upon it precisely equal to that of the magnetism of the earth, it will tend to deflect it into a position exactly at right angles to the one it originally occupied. This position is represented by the line *A B*. But the two opposing forces acting upon the needle being equal, the latter will assume a position equidistant between *N* and *B*, which is called the *resultant*, and corresponds to the diagonal line *A 1* in the figure, which is at an angle of 45° with the zero line *N S*. Now, if we double the strength of the current traversing the conductor, the needle will assume the position denoted by the line *A 2*, which is an angle of 63½° nearly. If we again double the strength of current, we shall increase the deflection to 76°, represented by the line *A 4*. The line *N 4* is termed in geometry a *tangent* to the arc or quadrant *N B*. It is therefore desirable for the student who has occasion to use a tangent galvanometer, to provide himself with a table of natural tangents, which may be found in most works on trigonometry and surveying, as well as in Haskins', Clark's and Culley's hand-books. Such a table gives the tangent corresponding to every degree and half degree of the scale. For example, if we call the distance from *A* to *N* unity or 1, the tangent of 45° is 1 also, because a line drawn from the centre at *A*, at an angle of 45° to the line *A N*, will intersect the line *N 4* at *1*, and the distance from *N* to *1* is the same as that from *A* to *N*. In the same way the tangent of

and there are several different modes of construction by which these are fulfilled with sufficient accuracy for all practical purposes.

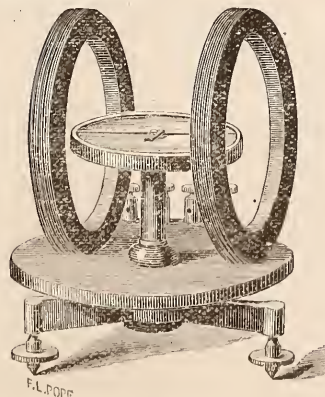


Fig. 13.

Weber's Galvanometer.

The earliest and simplest form of tangent galvanometer was that designed by Professor W. E. Weber, of Gottingen. This consists of a circular coil or ring

position of the centre of any magnet is not absolutely certain; and according to the researches of Clerk Maxwell, an eminent mathematician, Gaugain's coil, with an eccentrically suspended magnet, is subject to far greater uncertainty than even Weber's.

Farmer's Tangent Galvanometer.

Mr. Moses G. Farmer converted Gaugain's galvanometer into a trustworthy instrument by placing a second coil, equal to the first, at an equal distance on the opposite side of the needle. It is found to be quite unnecessary in this case to wind the coils upon a conical surface, as all the necessary conditions are equally well satisfied by coils of rectangular section, which have the further advantage that they can be constructed with far greater accuracy than is possible where the wire has to be wound upon an obtuse cone. Mr. Farmer's galvanometer is shown in figure 13. The mode of construction was invented by him in 1853 or '54, and a number of them were subsequently made by him. In 1859 he constructed a very fine one with 18 inch coils, and a compass 10 inches in diameter, graduated to 6' of arc, and which could be read to 1' without difficulty. This instrument would give correct indications as high as 89° 45'. It was unfortunately destroyed by fire in 1868. In a galvanometer constructed upon this plan the coils must be in exactly parallel planes, and the distance between them equal to their radius or one half their diameter. The magnet is suspended

equi-distant between the coils and in their common axis.

Bradley's Tangent Galvanometer.

The arrangement differs materially from any of those previously described. It consists of a circular or disc needle, either composed of a single piece of steel, or of several short needles placed side by side, and the whole trimmed into a circular form. The north and south poles of the circular needle are at opposite points upon its circumference. Light aluminum pointers are attached to the disc for registering its movements. The coil is flat and is placed directly underneath the needle, and in close proximity to it. The breadth of the coil slightly exceeds the diameter of the needle. This mode of construction, which was invented in 1866, by Dr. L. Bradley of Jersey City, combines in a high degree the merits of compactness, portability and accuracy, and has come into extensive use. Figure 14 gives a very good idea of its external appearance.

(To be continued.)

Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NOS. 55, 56 AND 57, UP TO AND INCLUDING MARCH 10, 1874.

5, 17, 25, 26, 28, 29, 37, 42, 52, 53, 56, 59, 60, 64, 65, 74, 77, 86, 88, 90, 91, 95, 101, 108, 113, 122, 133, 140, 145, 157, 211, 215, 217, 220, 228, 235, 245, 254, 267, 269, 274, 276, 277, 286, 301, 302, 312, 342, 349, 351, 352, 380, 381, 383, 385, 391, 416, 526, 564, 509, 516, 526, 532, 536, 546, 547, 549, 564, 576, 579, 587, 603, 615, 656, 661, 672, 708, 715, 721, 734, 740, 741, 742, 769, 775, 789, 799, 821, 832, 873, 915, 917, 923, 943, 976, 977, 996, 1001, 1023, 1024, 1028, 1039, 1040, 1054, 1061, 1081, 1088, 1090, 1126, 1144, 1147, 1148, 1154, 1167, 1173, 1174, 1175, 1178, 1183, 1199, 1200, 1205, 1210, 1225, 1232, 1233, 1245, 1259, 1260, 1266, 1298, 1300, 1306, 1325, 1329, 1343, 1357, 1364, 1365, 1394, 1402, 1403, 1404, 1409, 1410, 1412, 1440, 1484, 1489, 1517, 1518, 1524, 1527, 1552, 1554, 1571, 1568, 1572, 1580, 1500, 1591, 1615, 1630, 1635, 1658, 1697, 1698, 1729, 1735, 1736, 1790, 1809, 1811, 1812, 1818, 1831, 1852, 1862, 1869, 1881, 1894, 1906, 1919, 1943, 1944, 1950, 1970, 2019, 2020, 2021, 2027, 2029, 2030, 2036, 2049, 2069, 2073, 2086, 2097, 2096, 2114, 2118, 2133, 2135, 2136, 2142, 2158, 2160, 2162, 2164, 2169, 2172, 2174, 2178, 2179, 2186, 2187, 2190.

ASSESSMENT NO. 55.

15, 21, 23, 23, 188, 238, 289, 303, 553, 626, 662, 722, 787, 858, 859, 870, 932, 1267, 1276, 1516, 1648, 1742, 2101, 2119, 2127, 2130, 2139, 2149, 2153, 2154, 2155, 2156, 2157, 2159, 2162, 2163, 2165, 2166, 2167, 2168, 2170, 2172, 2175, 2176, 2180, 2181, 2182, 2183, 2184, 2185, 2188, 2189, 2192, 2193.

ASSESSMENTS NOS. 53 AND 44.

17, 37, 93, 95, 142, 178, 182, 217, 237, 428, 429, 447, 490, 495, 497, 499, 500, 403, 504, 505, 506, 507, 508, 597, 671, 769, 789, 880, 920, 977, 996, 1028, 1038, 1104, 1130, 1182, 1187, 1224, 1228, 1264, 1256, 1488, 1495, 1496, 1553, 1646, 1677, 1812, 1729, 1736, 1743, 1810, 1813, 1921, 1935, 1994, 2055, 2056, 2105, 2115, 2132, 2194.

ASSESSMENTS NOS. 49, 50, 51 AND 52.

447, 490, 495, 507, 789, 1187, 1488, 1736, 1937, 2056, 2105, 2115.

MISCELLANEOUS.

49.—856.
50.—178, 856, 2132.
51.—95, 178, 880, 1028, 1038, 2132.
52.—95, 178, 1028, 1038, 1813, 2132.
54.—29.
56.—15, 188, 620, 722, 742, 1648, 2101, 2139, 2149.

Work of the Telegraph Construction and Maintenance Company in 1873.

THE report of the directors of the Telegraph Construction and Maintenance Company for the year 1873, has the following statement of the cables manufactured and laid by the company during the year, and of the work which it now has in hand and contracted for, for the current year:

During the year 1873 the following works have been carried out: The laying of a cable for the Anglo-American Company between Valentia and Heart's Content, Newfoundland, and two cables between Placentia and Sydney, Cape Breton, a total length of 2,470 nautical miles, and both sections of the French Atlantic Cable of 1869 have been successfully repaired. A duplicate cable for the Eastern Telegraph Company was laid during the summer between Lisbon and Falmouth, touching at Vigo (866 nautical miles), and the first section of the Brazilian cable (625 nautical miles) was submerged between Lisbon and Madeira, but in consequence of a fault having subsequently developed itself, the cable had to be broken in deep water to remove the fault; and, owing to the lateness of the season, and unusually tempestuous weather having set in,

the repair had to be abandoned until the spring of 1874. In fulfilment of a contract entered into some time since with the Eastern Telegraph Company, this company, assisted by Mr. W. T. Henley, of North Woolwich, have laid in the Levant 785 miles of cable, forming another connection between Italy and Egypt, via Zante and Candia. The West India and Panama Telegraph Company having applied to this company to put certain of their cables into working condition, and to lay a new cable between Jamaica and Panama (subsequently changed, so as to connect Jamaica with Porto Rico), the work was undertaken, and satisfactorily completed early in the present year. The total length of all cables laid during the past year amounts to 4,701 nautical miles. The manufacture of the second and third sections of the Brazilian cable has been so far completed that the operation of submerging them will be forthwith commenced, and it is expected to complete that contract by the middle of this year. Your directors have also to report that a contract has just been concluded with the Anglo-American Telegraph Company for the manufacture of 1,100 nautical miles of cable, and for laying the same, together with 900 miles surplus cable belonging to that company, between Ireland and Newfoundland, during the current year. The company has taken steps for extending the system of submarine telegraphy along the west coast of South America, where a valuable traffic awaits its completion; in furtherance of this object an exclusive concession has been secured from the Peruvian Government, and within eighteen months your directors hope to have laid a cable connecting Peru with Panama. The Tasmanian cable has been transferred to the Eastern Extension Telegraph Company, and now forms a part of its system.

Spanish Telegraphy in the year 1873.—Submarine Telegraphs.

THERE has been marked progress in telegraphy, notwithstanding the disturbed state of the country. The cable from Bilbao to Land's End was opened in January (1873). An interruption occurred in March, fourteen miles from Bilbao, but the injury was repaired by the end of April. A worse interruption was caused by the blockade of Bilbao by the Carlists. Concession was given in the beginning of the year for a cable from Barcelona to Italy, in connection with the line from England to Bilbao, while a land line was to be made from Bilbao by Madrid to Barcelona for the cable despatches. But owing to disturbances in the north, this scheme has been abandoned for a time; and M. Aparicio, to whom the concession for the Italian cable was transferred (from Mr. C. S. Stokes), is about to lay a cable from Barcelona to Marseilles. In June a cable was completed (by the Telegraph Construction and Maintenance Company) from England to Vigo, and it was extended in July, by another from Vigo to Lisbon. In January (1873) M. de Juan de Lasarte was authorized to lay a cable from the east coast of the peninsula to Havana in Cuba, passing through the Cayo. The concession has been transferred to M. Adolf Clave, and the plans, etc., have been submitted by Count de Brockman, an eminent engineer, but the civil war has prevented the necessary capital being supplied.—*Revista de Telegrafos.*

The Light Cable Company

WE are glad to see that the directors of the Light Cable Company, the prospectus of which was recently issued, have been so well advised as not to follow the example set by the promoters of a similar company—the British and North American Telegraph, which is just now occupying the attention of the Court of Chancery—and endeavor to float a concern which appears to have failed as signally and as completely as its predecessor has done. The directors, finding that the proposal to make a costly experiment at the expense of the public has not been fully appreciated, have issued a circular, in which they state that “the number of shares applied for by the public not being sufficient to enable the directors to make arrangements for laying a cable during this year, they have resolved to make no allotment, but to return the deposit moneys in full to each applicant.” The circular attributes the failure of the scheme to “the prejudiced attacks made by interested parties on this undertaking, casting doubts on the minds of investors as to the practicability of laying and working a light cable.” We do not perceive in the circular any statements to the effect that the promoters and directors of the company were themselves actuated exclusively by disinterested motives in their proposal to test, at the expense of the public, the practicability of laying and working a light cable across the Atlantic. It would have been only fair to the public to have assured them that the active promoters of this abortive scheme were not themselves “interested parties” before venturing upon this silly explanation of the cause of their miserable failure.—*The Railway News.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Testing Lines for Insulation Resistance.

HENPECK, March 10.

TO THE EDITOR OF THE TELEGRAPHER.

SCHWENDLER gives the following formula for testing line resistance: $L = 2 (R - \sqrt{R(R-r)})$. R = the measured insulation resistance of line, and r = wire resistance without relays in circuit. This formula is based upon the supposition that the escape is uniform, and is said to give the absolute wire resistance regardless of the escape through defective insulation. This word *absolute* is a very positive term, and should be used with caution. If we test a certain wire first by grounding at distant end; second, by opening at distant end, we get two results from which this *absolute* wire resistance is obtained. Suppose we repeat the test, but use double the battery employed in the first case; we get altogether another result. Is this also the *absolute* resistance? It would seem, that in order to get an *absolute* result it is necessary to use a definite amount of battery power. What is that definite amount? To arrive at the absolute resistance of a certain number of insulators with a definite battery power, it would be necessary to have them placed close together and all connected by a wire of no appreciable resistance. In practice, however, they are not so placed, and although every insulator may be exactly equal in resistance, yet, by virtue of their unequal distances from the testing station, no two will conduct the same amount of electricity from the line to earth; or, in other words, under these peculiar circumstances no two will be equal as insulators. Suppose we have a wire 100 miles long extending from A to B, and ordinarily worked with 75 cells of battery located at A. Now, with “B” open, test the resistance of insulation from A—care being taken to have instrument selected or arranged that will allow the same current to pass to line while being tested as when being worked. Will not the result thus obtained be *practically* the *absolute* resistance of the insulation? It of course will not be the resistance which would be obtained were the insulators all joined with a wire of no appreciable resistance, but as the arrangement is the same when line is being worked as when tested, is this not the *practical* resistance of the insulation in this particular case? If it is, then we have the following rule for obtaining the corrected wire resistance: Arrange testing battery so that the same *current* will flow to line while being tested as when being worked; divide the product of the apparent insulation resistance and the apparent wire resistance by their difference. This may be demonstrated as follows:

Let apparent insulation resistance = 5,000 ohms.

Let apparent wire resistance = 1,500 ohms.

Let correct wire resistance = X.

Fifteen hundred ohms represents the joint resistance of the wire and insulation. Then if, as stated above, the 5,000 ohms represents the *practical* insulation resistance, according to the rule for finding joint resistance we would have $\frac{5000 X}{X + 5000} = 1500$, or $X =$

$2142 + \text{ohms}$ —which is equivalent to dividing the product by the difference. According to Schwendler's formula, we would have for the corrected wire resistance 1634—quite a difference—which result is the nearest correct, practically speaking.

In Haskins' late work, at bottom of page 40, we find a formula for testing grounds. Is there not an error in printing it? Should it not be $\frac{L + S - R}{2} = G$?

PED.

Suggestions to Telegraph Employes.

TO THE EDITOR OF THE TELEGRAPHER.

THAT there should be dissatisfied persons in any business employing so many as does the telegraph is a matter of course. That these may imagine and believe that the cause for such dissatisfaction is the injustice and lack of recognition of their merits and services is but an incident of human nature. The columns of THE TELEGRAPHER almost weekly contain the evidences of the truth of the above reflections. The communications which are continually appearing from this class would give the impression to telegraphers as a body are exceedingly ill used and underpaid. The writers do not seem to consider that there may be two sides to this matter, and that all the wrong and injustice does not necessarily appertain to the telegraph employes.

It is not intended to claim or assert that there is in no case good ground for complaint and remonstrance. Quite otherwise. It is not unfrequently the case that telegraph employes are ill used and underpaid. When

such is the case it is right that such influences be brought to bear as, if possible, to correct the wrong and injustice, but it is apparent that this cannot be done by continual and persistent grumbling and complaining.

On the other hand, it is not unfrequently the case that telegraph employes obtain situations and receive compensation far better than their abilities warrant, or than they could obtain in any other business. And just here it would appear as if the principal cause of the difficulty lies. What is needed is a classification of positions and salaries and a system of promotion, which shall insure to the best qualified the positions and compensation to which they are entitled, and relegate the others to such positions and compensation as they are fitted for. It is safe to say that no telegraph company in this country has any system in this matter. Appointments and promotions are made haphazard, or from personal favoritism and influence, with but indifferent regard to the qualifications of the appointee.

If the intelligent and worthy portion of the great body of telegraph employes would take this matter into consideration, and would seek to establish a better state of things, wise and intelligent action on their part might eventually effect something. It is just here that a telegraphic organization is desirable and might prove effective. It is useless for telegraphers to write communications to THE TELEGRAPHER on the necessity and desirability of an organization of the telegraphers—and then let the matter drop. Most of those whose communications have appeared seem to have not the slightest conception of what such an organization should be, or what its real purposes ought to be, or how it shall be effected. They have an indefinite idea that in some way an organization will correct all the evils of which they complain, and establish a telegraphic millennium. Again, they are all waiting for somebody else to assume the responsibility and do the necessary work. The only way to effect an organization is to *start it*—first determining on a sensible and reasonable basis, with clearly defined purposes and objects, and, at least an idea of how these purposes and objects are to be attained. No matter how small the original body may be under such an arrangement, it will *grow*—slowly at first, it is true, but with constantly augmenting speed and vigor.

If this communication finds favor I may hereafter point out what it seems to me are the objects and purposes to be attained by such an organization, and how it may be effected.

COMMON SENSE.

The Telegraph College Humbug.

ALLIANCE, OHIO, March 10.

TO THE EDITOR OF THE TELEGRAPHER.

IN the last week's number of THE TELEGRAPHER I notice a communication over the signature of "Agitator," in regard to telegraph colleges, so called. Your correspondent so fully expresses my opinions on this subject that I cannot refrain from endorsing and approving of his communication through THE TELEGRAPHER.

In the instance which he sets forth so feelingly and properly of the poor duped German girl, is shown up what is a common occurrence all over the country. It shows very forcibly how these humbug telegraph colleges are swindling the young and unsuspecting, who are seeking for a means of livelihood, throughout the country; and it is no wonder that "Agitator" should enter his protest against them.

These so called telegraph schools, institutes or colleges are the greatest humbugs of the day, and telegraph operators, in justice to themselves, ought to take the matter in hand, and find means to suppress such frauds.

We cannot rely on telegraph companies or the organs of telegraph companies to act or protest against these institutions, and the reason is very evident. I could give you the names of more than a dozen prominent telegraph officials, whose names I have seen given in the glowing circulars issued by the proprietors of these humbugging institutes, as endorsing and recommending them. These men sell their names to these humbugs as endorsing them. Oh! how some men's consciences must be calloused and seared, to allow themselves to become the tools of such fellows.

"Agitator's" German girl reminds me forcibly of a similar incident right in the office where I am employed.

A certain young man residing in our city, who has been away attending one of these telegraph colleges with which our land is so well supplied, had spent about six months, and came home with a gorgeous *sheepskin*. It represented him as a first class operator, and he himself claimed to be able to receive thirty words per minute, and applied to our manager to know if he would allow him to come and practice in our office a few days. He said he only wished to learn the calls and the telegraph rules. So the young man obtained the consent of the manager, and accordingly came, and to his *own*, but not to our astonishment, he could not tell a single office call, to say nothing about receiving thirty words per minute. He has already been here over two months, and he knows but little more about the *art* than he did

when he first came into the office. I guess he has concluded that he would not have any need to learn the rules until after he knew something about telegraphing. Such is life! but, brethren, these things ought not so to be. "Agitator" is quite right; he only gives them their proper name when he calls them swindlers; they are such, and of a dangerous kind, too. It is not prejudice that makes me speak as I do, but actual observation.

Down with humbugs! Come again, "Agitator."

JOHN WILKES.

Experience of a Young Telegrapher.

STOUCS CITY, IOWA, February 27.

TO THE EDITOR OF THE TELEGRAPHER.

I WANT to say a word or two in praise of the present management of your paper. I think your policy of soliciting and encouraging correspondence from the telegraphers themselves a good one. My opinion is that the paper is now becoming better and more interesting every issue. The articles by the "old timers" are very readable. Although not an old timer, I remember when telegraph lines were not as plenty as now, and well remember the first instrument I ever saw. It was a "paper mill" of huge proportions, and sounded very much like a couple of boys hammering on a board. The operator sat in an arm chair, with his feet upon the desk. I was buying a ticket and "taking in" the telegraph department at the same time. All at once, Mr. Operator broke into a loud guffaw, and says, "That chap at Po spells Kansas K-a-u-z-a-s." I was doubly surprised—surprised that he could "tell what it said" without looking at the paper, and surprised that so scientific a man as an operator could be so illiterate as to spell Kansas so terribly. Then who "Fo" was puzzled me too.

From that hour I thought I never would be happy until I was an operator, and here I am, and that *rusher* at "Di" is calling me, too. There—didn't break him this time.

By the way, tell "Jennie" I'm a pretty good boy; don't smoke, chew, drink spirituous or malt liquors, wine or cider, never played but three games of billiards in my life. Then "M" at "Ma" treble discounted me, and beat me thirty points each game. It cost me seventy-five cents, which would be very acceptable at the present stage of the game. I really like the tone of her letter generally, but don't think telegraphers are morally any worse than any other class of people of like calling. With "73" all around, I bid you and your readers good bye. Still I am not happy; I can't put in any poetry to advantage.

C. ROSS

On a Telegraphers' Union.

TO THE EDITOR OF THE TELEGRAPHER.

MUCH has been written on the subject of a Telegraphers' Union, and many schemes have been advanced for the formation of a Union. And why is it no one is bold enough to come out openly and declare a Union which we must and will have? We need a Union for numerous good reasons: To break up the swindling institutions styling themselves telegraph colleges; to cut off the learners, and by so doing we bring the long wished for result—

Pay in proportion to our capabilities and labor.

To adjust matters in which we are most interested, and to secure to us those rights which belong to us, and which our employers are every day robbing us of.

We are men, and as such we are entitled to such privileges as by right belong to us. Every class of mechanics have unions, and why not we as well? What a grand and good thing it would be if we had as good an organization as the Locomotive Engineers!

How can this Union be formed? Brothers, let us organize in self-defence, and let us be governed by God's laws as laid down to us, and let our motto be: "In union is strength." We should arise and flock to our standard; put down all things which tend to lower our calling, and the desired result is obtained.

SCOTT.

Why we Should Support The Telegrapher.

TO THE EDITOR OF THE TELEGRAPHER.

THE difficulties and discouragements which are experienced in obtaining subscriptions to THE TELEGRAPHER among the average members of the fraternity, have been quite forcibly set forth in recent communications which have appeared in its columns. It is true that it is sometimes discouraging in presenting the claims of the paper to support to be met with indifference, and sometimes even rude refusals from those whose interests it is constantly laboring to advance. In some cases this comes from the fact that the parties are not actually aware of the real character and importance to them of the paper. In others—and these, perhaps, are the most numerous—there is an entire lack of appreciation of anything beyond the mere personal and sensual gratifications of the moment.

If I understand it aright, the purpose of THE TELEGRAPHER is to educate, as well as interest telegraphers. The amount of valuable instruction and information contained in a volume will be hardly conceived, unless an examination of a completed volume is made. In fact no practical telegrapher can afford to be without it who desires to advance in his chosen profession. If I could have my way its weekly visits should be paid to every telegraph office in the country, and every telegrapher should look forward to its coming with an interest which could not be felt in any other event of the week. Two dollars per year is, indeed, an insignificant sum compared to the consideration which is given for it. Another point which should be impressed upon the minds of all who are solicited to enroll themselves upon the subscription list of THE TELEGRAPHER is, that it is *constantly being improved*. A comparison of the volumes which have appeared during the past ten years will demonstrate that every succeeding volume has been an improvement on all which have preceded it, and the present volume has already shown a most marked and decided advance. The fact that it is quoted in other countries by leading newspapers and periodicals as the recognized authority in electrical science and telegraphic matter, in this country shows its appreciation by the scientific and practical minds throughout the world.

In presenting these considerations, it is my desire only to indicate the manner in which the claims of the paper should be presented to attract attention and secure support from telegraphers. Such a presentation, and that of the additional fact that it comprises a complete weekly record of telegraphic news and information throughout the world, would I think, give a success which would gladden the heart of the publisher, and enable him still further to enlarge and improve it. Let us all give an energetic and combined effort to the work of increasing the circulation of the only recognized telegraphic organ in this country.

TELEGRAPHER.

Well Informed Telegraphic Artists.

TO THE EDITOR OF THE TELEGRAPHER.

MUCH has been said by yourself and others regarding the knowledge etc., requisite to become a first class operator. Now, I respectfully submit the following, hoping that after its perusal you will be inclined to acknowledge that a class of men able to make so much out of a little historical fact certainly deserve to be classed above the "Bread and Beer" fraternity.

A few nights ago, upon one of the press wires radiating from the metropolis, while the regular sender was absent at his lunch, a "relief" operator, while transmitting "Honors to the memory of Sumner," came upon a passage in this wise:

"At a meeting held in the Church of — (few dots) (this must be a "nigger" name), Shiloh (t t s it) Shiloh (t t s darkey name), etc."

In a few moments one of the offices on the line came in with, "T t s good on U—t t church was named after a celebrated battle west, 'Shiloh'!" Now suppose you suggest to them that the name might have been derived from the Bible; being one of the names applied to our Lord and Saviour.

S.

"Soothe," Soothe Thyself.

TO THE EDITOR OF THE TELEGRAPHER.

"AGITATOR" has viewed himself in a "mirror." He never before discovered the fact, that sure enough there were the "two elongated auriform appendages on the sides of his head."

"Agitator" is an ass. He hereby *kindly* thanks "Soothe" for making the suggestion which has led to the discovery.

How easily it is for a man when cornered to resort to the low habit of calling names, thereby acknowledging that arguments fail him, and that he is utterly powerless to reply. How very humiliating then is the position into which "Soothe" has voluntarily surrendered himself. Placed *hors du combat* by an ass!! "Soothe," soothe thyself.

AGITATOR.

Correction of "Personal."

ISLAND POND, VT., March 17.

TO THE EDITOR OF THE TELEGRAPHER.

ALLOW me to make a correction of a "Personal," printed in THE TELEGRAPHER for the 14th inst. It is stated that Mr. Burbridge had resigned his position in the train despatcher's office of the G. T. R. at this place. This is incorrect, as he never worked in this office, but at a small water station on the Island Pond and Portland Division of the Grand Trunk Railroad.

CHIEF TRAIN DESPATCHER.

Subscribe for THE TELEGRAPHER—see terms on editorial page.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

SATURDAY, MARCH 21, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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THE TELEGRAPHER.

A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS OF THE

Telegraphic Fraternity and the Advancement of Electrical Science and the Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

TENTH VOLUME.

The Tenth Volume of THE TELEGRAPHER will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The TENTH VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the

TELEGRAPHIC FRATERNITY,

whose organ it is and will continue to be. It is a thoroughly

INDEPENDENT TELEGRAPHIC NEWSPAPER,

bound to, or in the interests of NO TELEGRAPHIC CLIQUE OR COMBINATION, but honestly devoted to the interests of the

PRACTICAL TELEGRAPHERS.

As heretofore, NO LABOR, TIME or EXPENSE, warranted by the patronage received, will be spared to improve its character, and add to its interest, and to sustain its reputation as the ONLY FIRST CLASS

ELECTRICAL AND TELEGRAPHIC JOURNAL

UPON THE

AMERICAN CONTINENT.

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Specimen Copies will be forwarded free on application.

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Any person sending the names and money for FOUR subscribers, at the regular price of subscription, two dollars per year, will be entitled to receive an extra copy free.

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Remittances for subscriptions may be made by mail, by post-office order or registered letter, at the risk of the Publisher, but no responsibility will be assumed for money sent without such precaution. On remittances of not less than FIVE DOLLARS the cost of the order or registration may be deducted from the amount.

Advertisements are solicited, and will be inserted at reasonable rates; but no Advertisement will be inserted for less than ONE DOLLAR per insertion.

All communications relating to or intended for THE TELEGRAPHER must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503,) NEW YORK.

The Rapid Increase and Extension of Cable Telegraph Lines.

THE statement which we reprint on another page from the report of the directors of the Telegraph Construction and Maintenance Company of England, of the operations of the company during the year 1873, exhibits the very rapid increase and extension of cable telegraphs throughout the world. It is but a few years, comparatively, since this branch of industry and enterprise was developed, but during that time it has grown with a rapidity which is almost unparalleled. It should be recollected, also, that there are two other extensive telegraph cable manufactories in England, both of which are successful and profitable enterprises, although neither of them can compare for extent and importance with the one to which attention is called. That of the Messrs. SIEMENS BROTHERS is now completing the cable for the United States Direct Cable Co., which it is intended to lay down during the coming season.

England has had a monopoly of this business of manufacturing deep sea cables from the start, and will probably retain it. Most of the capital invested in ocean cables has been supplied by English capitalists, and the headquarters of all the important cable telegraph companies is in London, and they are almost exclusively managed by Englishmen. The attempt to obtain capital for investment in cable lines in this country has always met with little success—our capitalists apparently being content to accept the facilities provided by foreign means, and our people content themselves with occasional spasmodic growls and complaints at so called cable monopolies, but without any real or earnest purposes to relieve themselves of such monopoly by participation in a business which has yielded munificent returns to those who have risked their means in establishing it.

It seems somewhat singular that Americans, who are generally supposed to be so shrewd and wide awake to profitable business opportunities; should have so persistently ignored this business, and permitted its profits to pass into the hands of foreigners. This is the more singular when we consider that it is to American zeal, persistence and energy, the earlier success of cable telegraphy is due. It can only be explained on the ground that originally there was little faith in the practicability of ocean telegraphy, and that when this had been demonstrated, faith in its extent and permanence was wanting. In the meantime, English capital and English enterprise had got a start in the business which gave them a monopoly of it. Various attempts have been made by sanguine promoters to establish cable telegraph enterprises in this country, but all, with the exception of the comparatively small one of the International (Cuba) Telegraph Company, proved abortive.

The Telegraph Construction and Maintenance Company has evidently been an exceptionally well managed corporation, and as it was the first in the field, and supplied with ample capital and facilities, it has had the best and most profitable part of the business. The profitable character of the work is shown by the fact that upon its last year's business it divided twenty per cent. to its shareholders, besides carrying a large amount to the reserve or surplus account. It now has in hand some large contracts, and, from present indications, its business the current year will be fully as extensive and profitable as in 1873.

The requirements and necessities of cable laying, as demonstrated in the case of the first Atlantic cable, demanded very large ocean steamships for the purpose. Fortunately, the Great Eastern was in existence, and it was found that the big ship which had proved a failure for the purpose for which she was designed, was just what was needed for this special service. She was transformed into a cable ship, and will probably never be used for anything else. We printed last week an account of the launch and a description of a new monster steamship, the Faraday, which has a registered tonnage of 5,000, and an actual carrying capacity of about 6,000 tons, which has just been built at Newcastle for the SIEMENS BROTHERS, especially for cable service.

Her first use is intended to be in laying the cable of the U. S. Direct Cable Company, to which we have before referred. Having been constructed especially for this service, which the Great Eastern was not, every necessary convenience is provided for the business in which she is to be engaged. Without these enormous vessels it would be very difficult to lay very long cables. With them the work is as certain, and attended with as little comparative difficulty, as any other.

The increasing demand for telegraph cable service will constantly require the manufacture of additional cables for routes over which they are already laid, as well as for new routes which are constantly being developed. It is only a question of time, and, probably, of only a comparatively brief time when a cable shall be laid from our Pacific Coast to Japan and China. A United States naval vessel is now engaged in making the necessary soundings to determine the best and most feasible route, and our obliging English friends, it is understood, are ready to furnish the capital and manufacture the cable for this route also. We should prefer that this cable should be provided by American enterprise and established with American capital; but as there seems to be little chance for this, we must be content to accept the favors of foreign capitalists, and see the management of this company also practically centred in London. The line must be established, and if American capital and capitalists will not do it, why, it is useless to waste time in repining.

The rapid extension of ocean telegraphs is scarcely less marvellous than the facility with which communication is had over thousands of miles of electric cord buried beneath the waves. The whole world is being rapidly bound together by the slender telegraph cables, and time and distance are practically annihilated. We have become so accustomed to these marvels that we take them as a matter of course, and most of those who daily read reports in the morning and evening newspapers of what is transpiring in the uttermost parts of the earth never give a thought to the wonderful advance which science and art have made in these latter days.

The manufacture of telegraph cables appears to have nearly reached perfection. There may be room for improvement in the details, but experience has shown that the heavy armored cables are the best, and it will be difficult to convince those who are familiar with such lines of the practicability and permanence of lighter cables, whose only recommendation is, that they are less expensive and more easily laid. The promoters of the Light Cable Company, whose prospectus was recently brought out in London, were unable to obtain any considerable subscriptions to its capital, and the project was very wisely withdrawn. We are aware that some able scientific men have expressed confidence in the feasibility of successfully laying, operating and maintaining these light cables; but the weight of evidence is against them, and it is evident that few are willing to risk their money in experiments which have so little, if any, chance of success.

The heavy and thoroughly well constructed telegraph cables are necessarily expensive, and until the speed of transmission of signals through them can be very largely increased, the charges for cable telegraphy will be comparatively heavy. It is in this direction that many are now experimenting, and we have confidence that eventually a very material increase of capacity will be developed. When this is accomplished it will be feasible to greatly reduce the presents rates for cable telegraph service. This and a bona fide competition in the business can alone insure such a reduction. The U. S. Direct Cable Company promises the competition, and he or they who shall first develop a system of working through the cables which shall double or treble their capacity will have solved the other factor in the problem of cheap ocean telegraphy.

"I'll not take business from that man."
"Why not?" the chief asks, with a shrug;
"Because this says: 'Att wem cog hog.'
"And 'bring a purple ostrich plug.'"

—The Switch.

Congress and the Patent Office.

It is probably not too much to say that the greater part of the readers of THE TELEGRAPHER are interested more or less, in one way or another, in patents. Notwithstanding its frequent and obvious defects as at present constituted the patent system of the United States is unquestionably far superior as a whole to that of any other country, and the actual money value of the benefits it has conferred upon the people of this country are simply incalculable. We might mention half a dozen single patented inventions, such as the sewing machine, the harvester, the telegraph and others, each one of which has increased the wealth of the country by an amount far exceeding the whole cost of maintaining the Patent Office from its foundation to the present day.

Representing, as THE TELEGRAPHER does, one of the leading interests above referred to, and one in which the inventive spirit is just now unusually active, we have lately taken occasion to look a little into some matters of paramount and vital interest to all inventors, and if possible of even greater importance to the particular class which we represent than to most others. We refer to the reproduction and publication of the drawings of past inventions, now on file in the Patent Office, and of the specifications in an abridged and convenient form.

The object of the patent laws is defined by the Constitution to be "the promotion of useful arts." This is accomplished, in part, by giving to each inventor a legal monopoly of his invention for a specified term of years; but it is a matter of scarcely less importance that each inventor may be enabled to inform himself promptly and at a small expense of what has been done and is being done by all the others, for without such knowledge it is utterly impossible for him to pursue his investigations either intelligently or economically. He cannot otherwise be certain that he is not wasting his time and his money in re-inventing some old device, or that the labor and thought of years may not be crowned with disappointment and failure, which might have been avoided had he been acquainted with the previous labors of others in the same field.

The present admirable system of promptly reproducing copies of each patent as issued, and selling them at reasonable rates to all applicants, went into effect July 15, 1871. Prior to that time there had been issued, in round numbers, about 115,130 patents. According to the *Official Gazette* of February 18, 1873, we find that at that date 20,400 of the back patents had been reproduced by the photo-lithographic process, while by the *Gazette* of February 17, 1874, it appears that the number had reached nearly 40,000, showing that some 20,000 had been copied during the past year, which would leave about seventy-five thousand still to be done. At this rate, the work should be completed in about four years.

Inventors and others interested, have experienced such immense benefits from the facilities afforded them by the work already done, that they are eager to have the whole completed at the earliest possible moment. As far as our own constituency are concerned, we are happy to be able to inform them that the electrical class, consisting of nearly 900 cases, is making rapid and satisfactory progress, and will probably be ready within two or three months. When this is done, persons living at a distance will be able to cheaply and speedily procure copies of references given by the office in examining applications for patents; or, if desirable, procure copies of everything that has been patented in any particular subject—often a matter of the utmost importance.

Notwithstanding all that has been done, there has been much complaint, and justly so, among inventors and others doing business with the office, at the slow rate of progress which is being made in this work, when its importance and necessity are so universally acknowledged. But the fault does not lie, as some of our correspondents seem to think, with the Commissioner. The true explanation is that the amount of

work that this official can have done is limited by the appropriations Congress allows him—we cannot say gives him, for, as far as we can ascertain, the Government never gives anything to the Patent Office. The fees paid by inventors are more than sufficient to support the office, and Congress simply directs the Commissioner as to how much of the surplus he may spend. As an example of this, we would call attention to the following figures from the report of 1873:

Amount paid for photo-lithographing back issues.....	\$52,485. 3
Amount received for copies.....	67,171.32

Thus the Government actually makes a profit on the needs of inventors—a class usually of limited means, yet one that contributes perhaps more than any other to the comfort and advancement of society.

We hold that it is a gross injustice to inventors for the Government to make the Patent Office a source of profit. The surplus should either be reduced by reducing the fees, or it should be expended solely for the benefit of inventors in improving the facilities of the office, and, as a natural consequence, the character of the work performed by it. No one, so far as we know, asks to have the fees reduced, but every inventor has a personal interest in the prosecution of the work we have referred to. Nor should this work cease when the back drawings are all published. The office should also take up another matter, scarcely second in importance to that already mentioned: that of preparing a series of separate digests of each of the 144 classes into which experience has shown that patented inventions naturally group themselves. This has already been done by the British Government, and should be done at once by ours.

On the 1st of January, 1874, there stood to the credit of the Patent Office in the United States Treasury the sum of \$806,124.21. This surplus fund has accumulated from fees paid by applicants for patents. We demand, as we have a right to, that every cent of this fund be judiciously appropriated and expended for the benefit of the office and the inventors of the country. The appropriations for reproducing the back patents ought to be doubled, and at least \$100,000 ought to be allowed for this purpose during the coming year, in order that this most necessary work may be pushed to speedy completion. The preparation of the digests above referred to ought also to be commenced at an early day, and completed without unnecessary loss of time.

Even in the present state of public feeling in regard to retrenchment and economy, Congress need have no fear that the country will find fault if liberal appropriations are made for carrying on the work of the Patent Office. It is the universal opinion that the money will be honestly and judiciously expended under the present administration of the office. Indeed, if Congress fears to make such seemingly large appropriations, it can at least authorize the Commissioner to expend for this purpose all the moneys actually received for copies of patents. This would merely be taking the money intrusted to the government by inventors for a specific purpose, and using the whole of it for that purpose, instead of, as heretofore, using only a part of it and turning the rest into the surplus fund.

Representing, as we do, a large class of inventors whose labors have perhaps done more to facilitate the transaction of commercial and manufacturing business throughout the world than any other that could be named, and fearing that, under the influence of the universal cry for retrenchment, Congress might be induced to withhold from the Patent Office money that not only rightfully belongs to it, but is imperatively needed for the protection of the interests of the class from whom it was originally derived, we have felt it a duty to devote considerable space to the proper presentation of the matter, feeling certain that nothing more than an adequate knowledge of the facts will be needed to prevent the ill effects that would certainly follow from hasty and injudicious legislation.

Valuable Contributions.

We print this week another of the series of articles on the *Elementary Principles of Electrical Measurement*, by Mr. F. L. POPE, which has met with such a favorable reception and appreciation. It will be found not less interesting and valuable than those which have preceded it. We are much gratified at the evidences which we are constantly receiving that these and similar contributions to the columns of THE TELEGRAPHER are read and appreciated by the fraternity generally. They impart information and instruction of the greatest use to all telegraphers, and will increase in value and interest as they progress. Other contributions of a like practical and scientific character are arranged for, and will appear during the present volume.

We are encouraged to believe that THE TELEGRAPHER is doing a good work in educating the practical telegraphers of the country up to a higher professional standard than they have hitherto generally attained, and that this fact is beginning to be appreciated.

Notwithstanding this we do not propose to relax our efforts to make the paper a complete record of telegraphic news and information, and to enliven its columns with the lighter and more amusing incidents of telegraphic service, giving also due place and prominence to the correspondence on matters of practical personal and professional interest. In short, we are striving to make THE TELEGRAPHER a journal of so much importance that no telegrapher or electrician can afford to be without it.

The Operator.

We have received the second number of a new telegraph journal, entitled *The Operator*, published in this city by Messrs. SAMUEL L. WELP and THOMAS ALLEN, Western Union employes. It is a neatly printed paper, published bi-monthly, and is devoted to personals, squibs, etc., relative to Western Union employes in this city and elsewhere. It is of the same class as *The Switch* and *Fraternity* of Chicago.

Personals.

AN old friend wishes to learn the present address of Mr. J. A. WRIGHT, who was agent and operator at Centreville, Crawford County, Pa., on the Oil Creek Railroad in 1866-67. He left there to engage in the lightning rod business, with headquarters somewhere near Chillicothe, Ohio. Any person knowing his present address is requested to communicate the same to the editor of THE TELEGRAPHER.

Mr. C. W. PRICE, formerly manager of the Pennsylvania R. R. telegraph office, at 526 Broadway, New York, has resigned, and established a general railroad, steamboat, steamship and telegraph office at Barnum's Hotel, Twentieth street and Broadway, connecting with the Atlantic and Pacific Telegraph Company.

Mr. B. M. DAMON, formerly freight clerk and operator, J. L. & S. R. R., East Saginaw, Mich., has resigned and accepted a situation on the Canada Southern R. R.

Mr. J. E. WEIRMAN has accepted a situation as freight clerk and operator of the J. L. & S. R. R. at East Saginaw, Mich.

Miss JENNIE TURNER has accepted the position of agent and operator at Crawford station J. L. & S. R. R., vice Mr. CORBETT transferred.

Mr. J. E. CORBETT has been transferred from Crawford station J. L. & S. R. R. to Gaylords, Mich., as agent and operator for the same road.

Pass Him Round.

Mr. WILLIAM MCCALLUM, an Englishman who was employed as operator for the Atlantic and Pacific Telegraph Co., at the Park Hotel office in this city, recently departed unceremoniously for parts unknown, a defaulter to the company for between eighty and ninety dollars, receipts of the office. Any information in regard to his present whereabouts would very much oblige the company. What makes the case particularly outrageous is that the situation was given to him in order to enable him to live through the winter, he being destitute and dependent upon the kindness of friends for subsistence previously. Pass him round.

The Telegraph.

The Kansas City Metropolitan Telegraph Company.

KANSAS CITY, Mo., has a city telegraph line under the above title, which is connected with the hotels, pork packing houses, stock yards, city telegraph office and the suburbs. It is intended by the company to extend the line this spring, open up a number of new offices in business houses and generally increase the usefulness of the institution, which is already extensively availed of by many business men. The President of the company, Mr. Wm. A. Smith, formerly of Cincinnati, is a prominent business man and banker of Kansas City, and the Superintendent and Manager is Mr. D. A. Williams, a practical and experienced telegrapher.

The Proposed Texas Military Line.

THE Chief Signal Officer informs the House that the proposed military telegraph line in Texas would be 1,275 miles long, and would cost \$100 per mile, provided the soldiers construct it. To keep it in repair, he estimates, would cost \$8 per mile annually. Both the military authorities and the Texas delegation are urging the construction of the telegraph as a means of protecting the frontier against Indian raids.

Foreign Telegraphic Notes.

THE Brazilian Submarine Telegraph Company (Limited) have notified that their cable between Madeira and St. Vincent is expected to be laid in March, and that on the announcement of its opening for traffic, pending the restoration of the Madeira-Lisbon section, messages for South America and the Cape of Good Hope will be received to be sent by wire to Lisbon, thence by post to Madeira, from there to St. Vincent by telegraph, and finally by post to their destination. The rate from Great Britain for messages of twenty words to St. Vincent will be £2 17s. 6d., including agency and postage. When the Lisbon-Madeira section is restored the messages will be sent direct by wire from England to St. Vincent, and thence by post at the same rates, with an additional charge for postage of 1s. 6d.

The electric telegraph is being extended to the Midland districts of South Africa, and will thence be continued to the Diamond Fields, and probably further on to the Gold Fields.

Telegraphic and Electrical Brevities.

THE operators at the Bennaventura street, Montreal, Lachine Junction, Broekville and Belleville stations of the Grand Trunk Railroad now work eight hours per day only. The change is duly appreciated by them.

Parties in Oregon are memorializing Congress to pass the bill, now pending, authorizing the Portland, Dalles and Salt Lake Railroad and Telegraph to be constructed—the Government to pay interest on the bonds authorized by the bill to be issued by the company. These memorialists claim that the road will be of national interest, but similar claims have been often set up before, and lately have all been denied. From present indications the bill, in its present shape, will not be passed.

Electrical Construction and Maintenance Company, of San Francisco, Cal.

THE Electrical Construction and Maintenance Company, of San Francisco, Cal., having a very modest beginning two or three years ago, has rapidly extended and developed into an important enterprise, and now furnishes the larger part of the electrical and telegraphic apparatus and material for the Pacific coast. The capital of the company is \$100,000, and it at present furnishes employment to thirty-five men, and occupies the entire third story of the building, No. 134 Sutton street, covering an area of 66 by 120 feet. Of this company Mr. George S. Ladd is President, and Mr. Stephen D. Field, Secretary and Electrician.

Dots and Dashes in the Stock Exchange.

THE bulls and bears readily take a fancy to anything that produces a noise. For this reason they have entered heartily into the manipulation of "Snapper" sounders.

This novelty soon became generally known among the brokers, and so rapidly did they multiply and so vigorously were they worked, that the noise became so exercising as to interfere with the transaction of business.

A fine of five dollars was then imposed upon any member of the Board who was detected in the act of working one of these sounders.

This tended to increase the nuisance, as the members

exult in violating a rule of this kind. They now work them in their pockets, or lay them on the floor and perform that celebrated act known among telegraphers as "writing with their feet."

It was expected that the Governing Committee would pass a rule for the suppression of this telegraph college, but the President of the Exchange is now busily engaged in learning the alphabet, so the law will probably not be enacted until he gets tired of it.

Why is electricity like the police when they are wanted? Because it is an invisible force.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

MARCH.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
12.....	75½ 76¾	.....	.....
13.....	75½ 76¾	16½ 16½	57½ 57½
14.....	75¾ 76¾	.....	.....
16.....	75¾ 78	.....	60 58
17.....	77½ 78¼	17 17	60 59¾
18.....	76¾ 78¾	.....	..... 59¾

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each: Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended February 3, 1874, and bearing that date. 146,996.—TELEGRAPH-INSULATOR. Peter Eby, Salisbury township, near Kinzer's Post office, Lancaster county, Pa. Application filed August 5, 1873.

A sectional insulating plug, through which the wire passes, is secured by a groove which fits over a flange in a cylindrical vertical holder formed to shed rain from the wire, which is fastened from slipping by a leaden or other non-conducting wire.

1. The metallic cylindrical holder D, having an internal flange, E, open at e, and provided with a projecting water-table, d, below, and with cap or lid, G, to cover the top, together with the arm H of the holder, in combination with an insulator made in two sections, A B, and inserted vertically into said holder, substantially in the manner and for the purpose specified.
2. In combination with the flange cylindrical holder D E e, the sectional insulator A B, when inserted vertically with its sectional groove M horizontal and below the holder, and securing the ordinary wire W by means of a non-conducting and non-corroding material like leaden wire, passed through perforations N, made in said sections, the whole jointly connected, and operated in the manner and for the purpose mentioned.

147,020.—APPARATUS FOR LIGHTING GAS BY FRICTIONAL ELECTRICITY. John P. Putnam, Boston, Mass. Application filed July 5, 1873.

The turning of the gas cock rotates the electrophorous, brings the burner in proper relation to the conducting wires for being lighted, and immediately afterward separates the wires from the flame.

1. In an apparatus for lighting gas by frictional electricity, the combination of the following elements, viz.: The gas pipe G, the rotating tube T, cock J, electrophorous and conducting wires L L', arranged and operating substantially as and for the purpose set forth.
2. The combination of the hermetically closed case Q and the rotating tube T, passing through said case, and terminated at its lower end by a conical gas cock, J, substantially as and for the purpose set forth.
3. The combination of the rotating tube T, projecting pin P'' cog wheel W'', provided with the pin P', or its equivalent, cog wheel W', conducting wires L L', sockets Z Z', and spring S'', substantially as and for the purpose set forth.
4. The conducting wires L L', having their ends curved to conform to the shape of the chimney, all parts of said arms being removed an equal distance from the flame, these outward movements being limited by said chimney, substantially as shown and described.
5. The combination of the rotating gas tube T, insulating tube T', rotating disk D, square tube T'', disk D', square tube T''', pin P', wheel W, pulleys Y Y, cover C, and cords X X, substantially as described.

147,183.—PRINTING TELEGRAPH. John E. Smith, New York, N. Y. Application filed May 15, 1873.

Two line wires; type wheel magnet in one circuit; printing, unison, and an additional coil, reverse to main coil, on type wheel magnet in other circuit, which is normally closed, being broken only to throw in unison D' e. While a resistance is in circuit the current cannot energize printing magnet, the printing being affected by cutting resistance out by K'.

1. The insulated screw o and wires n' n'', in combination with the helices C1 C1 and the lever D, essentially as herein set forth.
2. The magnet C2 and the lever D', in combination with the pin e and the key K, substantially as specified.
3. The key K', situated in a shunt circuit of the resistance F, to cut the same out of circuit, essentially as described.
4. The combination of the magnets C2 C3 and the helices C1 with the circuit n and the resistance F, substantially as specified.
5. The combination of the magnets C2 C3, the lines m and n the wheel E, the arm J, and the key-frame or ring H, essentially as described.
6. An inking wheel, the body of which is composed of cork covered with cloth, substantially as and for the purposes specified.

147,186.—MORSE TELEGRAPH REGISTER. John E. Smith, New York, N. Y. Application filed May 2, 1873.

Pad or spring E on armature lever stops clockwork by friction while circuit is closed. Speed governed by pallet D instead of fly.

1. The pad or spring E, in combination with the lever F of an electro-magnet and the clockwork of a recording telegraph, substantially as and for the purpose described.
2. The pallet D, in combination with the pad or spring E, the lever F, and the clockwork of a recording telegraph, essentially as herein set forth.

Married.

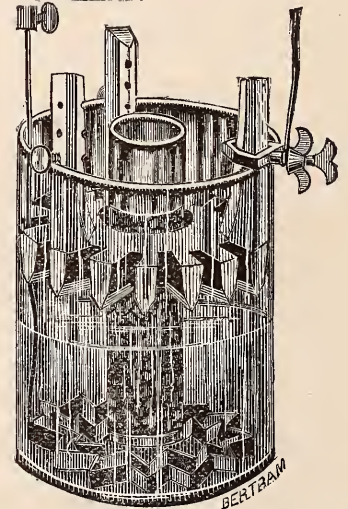
HUNTINGTON—SWAYZE.—In Forestville, Mich., Feb. 23, 1874, Mr. GEO. E. HUNTINGTON, train despatcher, M. C. R. R., J. L. & S. Division, Saginaw City, Mich., to Miss GUSTA A. SWAYZE, of Forestville.

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Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

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It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

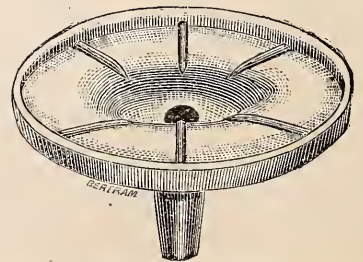
For closed circuit it is without a rival.

All kinds of Battery and Battery material for

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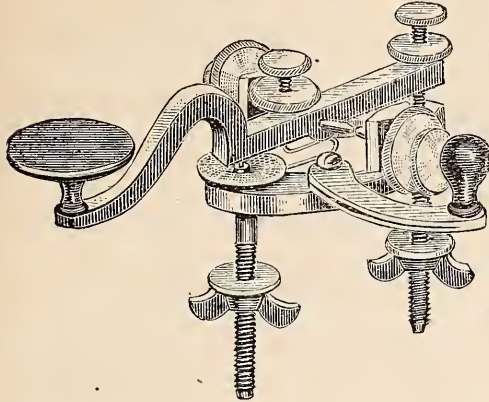
Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

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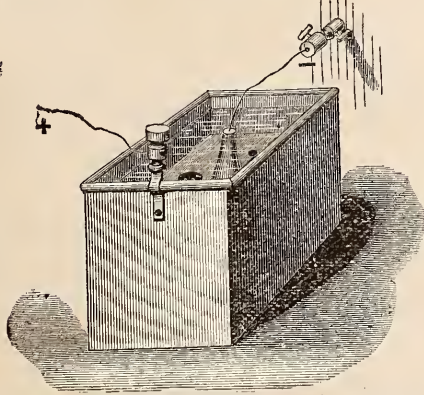
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

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Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

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now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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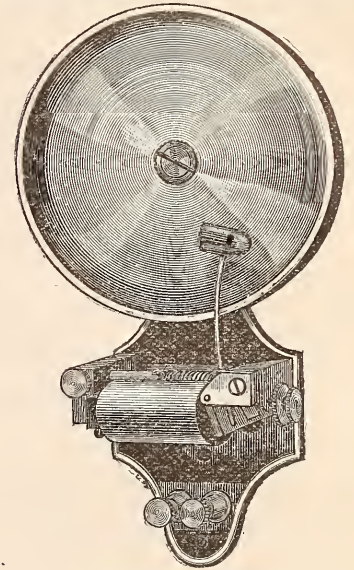
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Instruments, Line Material, Office Wire, Magnet Wire, Tools,
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One half of actual size

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NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

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Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

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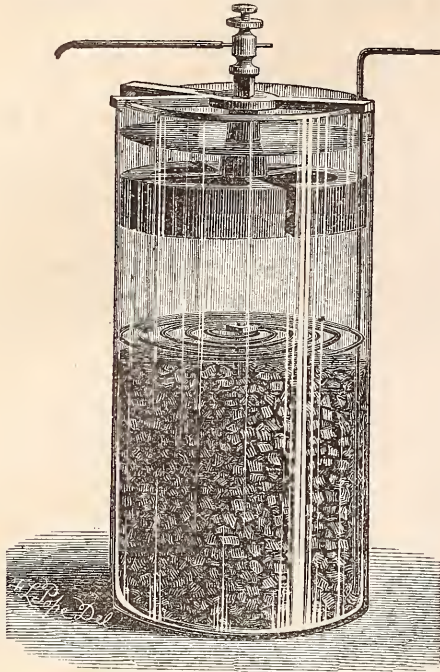
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-500th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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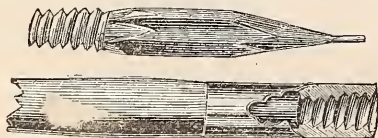
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The Telegrapher

A Journal of Electrical Progress

Vol. X.

New York, Saturday, March 28, 1874.

Whole No. 402

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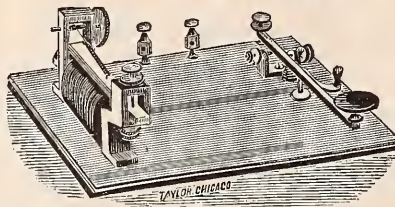
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In operating a short line there will only be required, in addition to the above, more cups of battery, according to the length of line.



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There are some *Six Hundred and Twenty-five* Illustrations in the Edition of 1859, and the present coming Edition will contain at least *One Thousand*, descriptive of the latest improvements.

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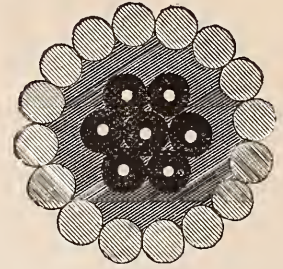
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THE TELEGRAPHER

A JOURNAL OF

ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MARCH 28, 1874.

VOL. X. WHOLE No. 402.

Original Articles.

Testing Leaky Lines for Insulation and Conductivity.

A CORRESPONDENT OF THE TELEGRAPHER, who signs himself "Ped," in speaking of the testing of leaky lines for absolute insulation resistance, says:

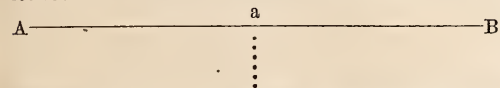
"To arrive at the absolute resistance of a certain number of insulators with a definite battery power, it would be necessary to have them placed close together and all connected by a wire of no appreciable resistance. In practice, however, they are not so placed, and although every insulator may be exactly equal in resistance, yet, by virtue of their unequal distances from the testing station, no two will conduct the same amount of electricity from the line to earth; or, in other words, under these peculiar circumstances, no two will be equal as insulators."

This is a correct statement of the actual facts in the case; but it does not seem to be quite clear to "Ped" that the precise object of Schwendler's and other similar formulas is that of determining the true resistance of the insulators, by eliminating from the result of the observed measurement the error introduced by the resistance of the line through which the insulators are measured.

For example: suppose we take a line insulated upon common glass, 100 miles in length and having 30 poles per mile. After an exposure of two or three years, such insulators would give, in a heavy rain, a resistance of say 10,000,000 units each. The actual resistance of the insulation of the whole line would, therefore, be

$$10,000,000 \div (30 \times 100) = 3333 + \text{units.}$$

But as each insulator is measured through a greater or less length of line wire, it is obvious that the result obtained by measuring the line from one end with the other end open would be considerably in excess of the true resistance of the insulation. The elimination of the true from the apparent insulation resistance can only be performed with entire accuracy by the aid of the calculus; but in practice a sufficiently close approximation is obtained if we consider the total escape to be concentrated at a single point, midway of the line, and it is upon this supposition that the formulæ are usually based. Thus, in the case above referred to, let A B



represent the line of 100 miles. The conductivity resistance will be, say, 2000 units. The total insulation resistance of 3333 units is supposed to be concentrated at a. Therefore, if we test this line from A, leaving it open at B, the apparent insulation resistance will be

$$\frac{2000}{2} = 1000 + 3333 = 4333.$$

The apparent conductivity resistance when the line is to ground at B, becomes a simple case of joint resistance; therefore

$$\frac{1000 \times 3333}{1000 + 3333} = 769 + 1000 = 1769.$$

Having thus found by calculation what the resistance should be when measured from A, first with B open and then with B to ground, let us reverse the operation and work out these measurements by Schwendler's formula, viz.:

Let R=apparent insulation resistance;
" r = " conductivity "

then the corrected conductivity resistance R' will be

$$R' = \sqrt{R(R-r)} \quad (1)$$

and the corrected insulation resistance (L) will be

$$L = 2(R - \sqrt{R(R-r)}) \quad (2)$$

Applying these formulæ to the case under consideration we get the following results:

Subtracting 1769 from 1433 leaves a remainder of 2564, which multiplied by 4333 gives us 11109812, the square root of which last is the value of R'.

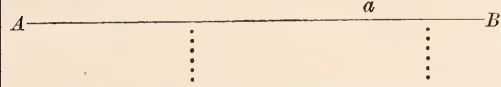
$$R' = 3333 +$$

To find the value of L in equation (2) we subtract the value of R' from that of R and multiply the remainder by 2.

$$4333 - 3333 = 1000 \times 2 = 2000.$$

Thus it will be seen that Schwendler's formula gives us the same numbers with which we originally set out, and, therefore, enables us to deduce the absolute resistance of the line wire and also that of the insulation from the observed measurements—upon the supposition, of course, that the resistances are practically uniform throughout the length of the line.

Now let us look at another case lately referred to the writer by a correspondent. A line of 93 miles, from A to a, is upon one kind of insulators, and on a section beyond this, of 6 miles, from a to B, another kind is used.



The following are the recorded tests from A:

Open at a.....14140 units.
" " B.....10740 "

The conductivity resistance is not given, nor the test to ground from which it might be deduced. We will assume it to be 18 units per mile.

It is required to know the mileage insulation resistance from A to a and also from a to B.

By Varley's formula, to be found on page 37 of Haskins' work:

$$\begin{aligned} \text{Let } 2x &= (\text{as above}) 93 \times 18 = 1674. \\ " R &= \text{do.} \quad 14140. \\ " R' &= \text{do.} \quad 10740. \end{aligned}$$

Also:

Let y = apparent insulation resistance of the second section, from a to B.

Let l = true insulation resistance of the first section, from A to a.

Supposing, as before, that all the escape of each section of the line is concentrated in the middle, then:

$$R - x = 1 \quad (3)$$

$$R' = x + \frac{1(x+y)}{1+x+y} \quad (4)$$

$$y = \frac{(R-x)l}{R-R'-x} \quad (5)$$

Transposing and substituting known numerical values in the above equations:

$$\begin{aligned} l &= 13303. \\ y &= 51212. \end{aligned}$$

Deducting half the conductivity resistance of the second section from y, gives its true insulation resistance (y'):

$$y' = 51158.$$

Multiplying these results by the number of miles in each section gives us the true mileage insulation:

For the first section.....1,237,179 per mile.
" second " 306,948 "

As your correspondent says, these tests ought to be taken with the same battery power as that ordinarily used to work the line.

The formula at the bottom of page 40 in Haskins' book should be $\frac{L+S-R}{2} = G$. Schwendler's formula

(page 39) should also be $L+2R - \sqrt{R(R-r)}$. The minus sign before the radical has been left out by a mistake of the printer. F. L. POPE.

Elizabeth, N. J., March, 1874.

On Working Wires of Different Resistances from a Single Battery.

SOME months since I was handed a letter from a chief operator in a western city, making certain enquiries in regard to the best method of working wires of widely varying resistance from a single battery. As this problem is one of frequent occurrence, and one of considerable practical importance, no apology is needed for presenting a short discussion of it in the columns of THE TELEGRAPHER.

It appears that the party referred to, upon taking charge of the wires in a large terminal office, found a single main battery employed to work the long circuits of some 300 miles, while a city line of moderate length was supplied by a separate battery of 18 cups. He changed the arrangement by adding these 18 cups to

the other main battery, and then attaching all the wires, including the city wire, to the end of the consolidated battery. He then employed an adjustable resistance, composed of two platinum plates immersed in water, by means of which the current upon the city wire was reduced to its proper strength. He states that the new arrangement works exceedingly well in practice, but that it is ridiculed by many of the other electricians of that locality, who contend that he should have "tapped" the main battery for the city line by attaching it at a distance of 18 cells, or thereabout, from the ground wire. He therefore writes to know who is right in the matter, and why.

Under the circumstances there is, of course, no doubt that the consolidation of the batteries was a good move, as the effective strength of current on the main circuits was considerably increased. The question is which is the best way of supplying the current to the city wire; whether to attach it at the end of the battery and reduce the current to the required strength by a resistance, or to "tap" the main battery at the proper point in the manner usually practiced?

The inquirer does not give the length of the city line, nor the number or kind of cells in the large battery, but this is, perhaps, not essential. Let it be assumed that the battery is a Grove; that there were originally 72 cells of battery, working three circuits of 300 miles each, and a battery of corresponding strength at the other end of each circuit, and that the city circuit with its instruments was equal to 50 miles of line, with no battery at the other end. Suppose each 300 mile circuit had 10 instruments of 200 units resistance each. This may not correspond with the facts in this particular case, but will serve to illustrate the principle.

If we call the resistance of the line wires 20 units per mile we have for each main wire:

$$\begin{aligned} 300 \text{ miles} \dots\dots &= 6000 \text{ units.} \\ 10 \text{ instruments} &= 2000 \text{ "} \end{aligned}$$

$$\text{Total} \dots\dots = 8000$$

The battery resistance, being comparatively very small, need not be taken into consideration.

For the city line we have:

Resistance of line and instruments, 1000 units.

Applying Ohm's law, that the strength of current in any circuit is found by dividing the electro-motive force by the resistance, we find the strength of current in each circuit on the original arrangement to be as follows:

$$\text{Joint resistance of 3 circuits } \frac{8000}{3} = 2666.6$$

$$\text{Strength of current leaving battery } \frac{72}{2666} = .027$$

This is divided between 3 circuits, which gives per circuit .009.

As there is supposed to be an equal battery at the other end of each circuit, the total strength of current in each of the long circuits would be .018.

$$\text{The short circuit would be } \frac{18}{1000} = .018 \text{ also.}$$

Now, if we add 18 cups to the original series of 72 cups, and transfer the city wire to the end of the consolidated battery, inserting a resistance of say 4,000 units, we shall have the following result:

Joint resistance of 3 long circuits (as above), 2666.6

" " " the 4 circuits.....1739.

$$\text{Current leaving battery } \frac{90}{1739} = \frac{90}{1739} .0517$$

This will divide between the four circuits in inverse ratio to the respective resistances as follows:

Current on city wire......018

" " each long wire......011 +

But each of the long wires is supposed to have 72 cups at the opposite end, giving a current of $\frac{72}{8000} = .009$

Add current from this end......011

Total current in each long wire......020

Therefore by this arrangement we get the same strength of current on the city wire (.018) that we originally had, while on the long circuits we get .020 instead of .018; an increase of more than 10 per cent.

Now take the other arrangement, viz., that of tapping the battery for the city wire, at a proper distance from the end, leaving 72 cups of the 90 working 3 wires, and the remaining 18 cups working 4 wires.

Joint resistance of all 4 wires.....727 units.

$$\text{Current from the 18 cups } \frac{18}{727} = \dots\dots.0246$$

The current produced by this portion of the battery will divide in the ratio of the respective resistances. The short line will get .0178, and the remainder, .006, will go to the 3 long wires.

The current of the 72 remaining cups will all go to the 3 long wires, which, as we have before seen, have a joint resistance of 2666. Dividing the number of

cups (72) by this, gives a quotient of .027, which, added to the balance of the current from the 18 cups, which we have found to be .006, gives a total for the 3 wires of .033, or .011 for each wire from the home battery, which is exactly what we got by the other arrangement. The strength on the city wire is a trifle less than before, only because the point at which the "taps" should be attached is between the 18th and 19th cups, while if placed between the 19th and 20th the current on this wire would be a trifle greater than in the first arrangement.

We find, then, that in theory it makes no difference which method is adopted for working a short wire out of the same battery that long wires are worked from. Practically the adjustable resistance would be the best, because an equal amount of work would be thrown on every cell in the battery, while with the "tap" arrangement the 18 cups would be worked much harder than the rest, and, under ordinary management, this unequal action is apt to give rise to waste of material.

F. L. POPE.

Elizabeth, N. J., March, 1874.

The Telegraphers who Disgrace the Profession.

BY DIOGENES.

AMONG the thousands engaged in telegraphic pursuits it is inevitable that there should be some who are a disgrace to the fraternity whose misfortune it is to include them among its members. The number of these among telegraphers is probably not larger, if so large, as in other professions, but all who have been engaged in the business can recall one or more of this class. There are various gradations even in this class, and those who are utterly worthless and contemptible are, fortunately for the credit of the fraternity, exceptions, and, it is to be hoped, rare exceptions.

There are some who are the victims of their appetites, who otherwise are good hearted; and, aside from their infirmity, are not discredit to the fraternity. These are generally whole souled fellows who are unable to restrain their convivial propensities, and indulge in intoxicating liquors, whenever they can be procured, to such an extent as to make them worthless and unreliable. This type is not so common now as in former times, when telegraphy was more of a Bohemian character than at present. They do not find it so easy to obtain situations as formerly, and when they do temporarily obtain employment their weakness soon sets them again afloat.

There are a few telegraphers who seem to be steeped in meanness and malevolence as to make them simply detestable, and whose early demise would be no misfortune either to themselves or the profession. They are a pest and nuisance to any office or line which may afford them temporary employment, and whenever one of them effects a lodgment, there is always more or less difficulty and dissatisfaction. Utterly heartless and selfish, they are continually striving to embroil their associates with each other and their employers, either from inherent depravity or in the hope in some way to profit thereby.

The worst case of this kind that can be recalled by the writer is well known to many of the readers of THE TELEGRAPHER, and it is some satisfaction that his true character has become so well known that it is extremely difficult now for him to obtain or retain a situation on any telegraph line. Of a mean and cowardly disposition, he is always seeking to undermine his associates in hopes of obtaining, which, fortunately, he never does, advancement and profit at their expense. He has been employed in many offices, his exit from which has been generally against his own desire and greatly to the joy of those who have been so unfortunate as to be compelled to associate with him for a time. Usually, after a short sojourn in an office, his companions ignore him as completely as the exigencies and requirements of the business will permit. Had he courage equal to his malignity and meanness he would bear about with him continual and forcible reminders of the indignation of those whom he has slandered and abused. While his conduct to his associates has been as mean and disgraceful as possible, he has been unremitting in his efforts to excite dissatisfaction and make trouble between the employers and employes of the lines on which he has been employed. No slander or abuse of his superiors has been too base for him to be guilty of, and, until his real character had developed itself, he succeeded in keeping in constant difficulty all with whom he was brought in contact. His flaming and bloated countenance proclaims unmistakably his devotion to the bottle, and his hogghish propensities and unlimited feeding capacity make him alike the terror and disgust of boarding house and hotel keepers and their guests.

The Telegraphers' League afforded this fellow an excellent opportunity to gratify his malevolent disposition, and he was one of the first who sought to embroil his fellows and the company by which they were employed. He was of course "a striker," and, of

course, after a few days, betrayed his brethren, and was one of the first to resume his situation in the employ of the company, who were glad to employ him as a frightful example to the others. His performance at the lunch table on his return to duty is said to have been astonishing, and there were fears that his defection would prove more costly to the company from the expense of supplying his insatiable maw with provisions than the benefit to be derived from his services at the key, or the influence of the example of his defection and perjury. Of course, in due time, when the requirement for his treachery had passed, he was ignominiously kicked out—as he ought to have been. What has become of him is unknown, but it is to be hoped that he has found his appropriate place, as a bar tender, or at some more degrading employment even.

This is an extreme case, it is true, and it is to be hoped that there are no others as bad. It shows, however, the possibility there is for such fellows to obtain entrance into, and for a time, some sort of standing in an honorable business.

There are others who disgrace the profession by an utter incapacity to properly discharge telegraphic duties. These drift about from line to line, and from office to office, seldom succeeding in long retaining a situation anywhere, always ready to accept any sort of a situation, at any rate of compensation. The worst effect of these is in regard to salaries. As they are glad to obtain situations at any price that may be offered—although at any rate which may be paid they are the most expensive employes that can be had—they prevent better and more capable operators from obtaining such compensation as their ability and services entitle them to. Many of this class are graduates of telegraph schools, so-called, who, having invested more or less in the attempt to obtain a telegraphic education, consider that for the rest of their lives telegraphy is bound to supply them with the means of prolonging their miserable existence.

It is hardly necessary to go on and detail all the different classes who, for various reasons, are a disgrace to the profession. The application of what has been said is not difficult of comprehension. It is that all competent and respectable telegraphers should seek to weed them out and exclude them permanently from the profession. This can be done by united action, and a standard of personal and professional character be established, which shall be for the credit and interest not only of the fraternity but also of the companies by whom they are employed, and of the public who are compelled to daily and hourly entrust to them the most vital and important interests.

Prominent Telegraphers of Elizabeth, New Jersey.

It seems to be a fact that Elizabeth is gradually becoming a resort for telegraphers, and among those residing here we find a number who are very prominent and whose names are as familiar among the fraternity as though bound by relationship. They are drawn here partly by personal solicitation, and partly by a desire to be brought in closer intercourse—a thing easily accomplished by the establishment of telegraphic communication between their several residences. Quite a few are already provided with this mode of communication, by a wire which starts near the corner of Morris avenue and Cherry street, and follows Cherry street southwardly, dropping in the residences of telegraphers in different parts of the city.

A visit among these "Knights of the Key" reveals many interesting and amusing arrangements provided for domestic use. At one place we find an electric bell, which creates an infernal racket if the room gets too hot or cold. At another we find a sort of electrical attachment on a dog—at least that is what it really amounts to. You proceed to open the outside gate, not cognizant that you are setting a trap for yourself. When behold! a two hundred pound dog appears on the steps and demands your card of admittance. This is brought about by means of an electric bell, worked in connection with the outside gate, which alarms the dog in the cellar. Gaining admittance, we find many more interesting arrangements provided for the protection and use of the family, such as burglar alarms, call bells, etc.

This, it is needless to say, is the residence of Mr. F. L. Pope, one of the acknowledged heads of the fraternity in this country. Mr. Pope has been connected with the business many years, and has manipulated, in his time, the Phelps, Halse and Hughes' Printing Telegraph, and the Morse and Bain Recording Telegraph; is the author of "Pope's Modern Practice of the Telegraph," the standard work of telegraphy in this country—also scientific editor of THE TELEGRAPHER; was commander of the American expedition to Alaska to survey the route for the proposed Russian telegraph. He has lately invented and patented several printing telegraphs and railroad signals. One of his signals has recently been placed at the crossing near the South Elizabeth station.

Mr. A. S. Brown, of this city, is likewise a "shining light," and said to be one of the fastest Morse receivers in the world. We are knowing of several trials of skill, in which he distinguished himself, and for which he will long be remembered. Mr. Brown was formerly operator on the old Albany and Buffalo lines, and, notwithstanding the many consolidations and changes that have taken place, he has gradually risen and now holds the management of the largest telegraph office in the country—corner of Broadway and Liberty street, New York.

D. R. Downer, also a resident of this city, is an old and well known telegrapher. Not being of a roving disposition, he may not have that extended acquaintance that others enjoy. Nevertheless, he is a first class operator, and well known to the fraternity through the Eastern and Southern States. He occupies the position of chief operator at Broadway and Liberty street, which is a position requiring all the qualifications for which he is noted.

R. W. Pope, of Cherry street, is connected with the Gold and Stock telegraph of New York; has been connected with the business for many years; was Quartermaster of the Telegraph Expedition to Alaska; organized the famous Telegraphers' League, and was twice elected Grand Chief Operator, the highest position in the gift of the fraternity. Recently he invented the "Snapper" sounder, which is having such an immense sale, and which is frequently to be heard on the cars and ferry boats.

Henry Van Hovenburgh, a late arrival, is a young telegrapher, but extensively known through the medium of his inventions. A few years ago he invented a peculiar and simple printing telegraph instrument, pronounced by competent electrical engineers to surpass anything of the kind in use. It was purchased, we believe, for \$10,000, by the Gold and Stock Telegraph Co. Mr. Van Hovenburgh is also the inventor of the "Rattler" sounder.

H. W. Pope, of Walnut street, is assistant superintendent of the American District Telegraph Company—a corporation organized for police, fire and messenger service in New York. The company employ 350 boys, a large number of policemen and have 2,600 signal boxes in stores, offices and residences in New York City. Mr. Pope is an old operator, and was formerly chief operator in the Private Line Department of the Gold and Stock Telegraph Company. Mr. Pope was a candidate for the superintendency of the Elizabeth Fire Telegraph, with a view to the establishment of a Police Telegraph in this city.

Jos. E. Fenn, of Orchard street, is an operator, and was formerly manager of the Atlantic and Pacific Telegraph in Brooklyn, afterwards Superintendent of the Gallagher Gold and Stock Telegraph Company. He was lately appointed General Superintendent of the Automatic Fire Alarm Company. This company is connected indirectly with the Board of underwriters of New York, and is one of the best arrangements for protection against fire that could be devised. The company's alarms are connected with the three Insurance Patrols. The instruments work on the principle of expansion and contraction by which an electrical signal is given—which indicates the building and the floor where the fire exists. The company are meeting with great success, and it has already become one of the leading enterprises of the day.

C. H. Walton, an old resident of the city, was formerly manager of the Elizabeth telegraph office. He is well and favorably known, and is at present connected with the Gold and Stock Telegraph Company of New York. There are several more telegraphers residing here, all of whom are a credit to the fraternity. Unfortunately we are not familiar with their history, and therefore cannot do them the honor at the present time that we should be pleased to.—*The Elizabeth Daily Journal.*

The Anglo-American Cable.

PROMOTERS of light as well as heavy cable companies, actuated solely by the benevolent and philanthropic idea of supplying the public with cheap telegraphy, will learn with satisfaction that a suggestion which we have made on several occasions—that the existing companies have it in their power to supply the "great want of this age"—will shortly be carried into effect. We have suggested that the messages sent through the cable, like that of passengers on the railways, might be divided into classes, and transmitted at greater or less speed as required. For some messages time is the essential element, and it is most important that they should reach their destination as quickly as possible; others, again, have not the same pressing importance, and can afford to wait their turn. For some hours in the day the pressure of business on the wires is very great, and such of those as are necessary to be sent with all possible despatch might be treated as "express" messages, upon which full rates should be paid, while others of a less urgent character might be sent at lower rates. By the summer of this year it is anticipated that the existing company will have four

cables available for messages; and we learn from the circular of Mr. Abbott, given on another page, that the company may then allocate two of the lines for ordinary messages at low rates—say, one shilling per word—while “for the commercial public, who value instant communication, and to whom a few minutes may be of vital importance, the two remaining cables could then be specially reserved for express service at express rates—thus introducing into the telegraph system the principle of a special rate, which would be freely paid for on an exceptional and instant service.” With such facilities as are possessed by the existing company the competition of a company owning only one cable would be out of the question, and the public would be infinitely better served than by rival companies. The competition of two companies would inevitably end, as in the case of railways, in combination, which would only be effected after the outlay of additional capital, which, in its turn, would absorb its proportion of the profits of the business in addition to that required to pay moderate dividends upon the capital already invested. Should the Anglo-American Company adopt the system of classification, it would secure to itself complete command of the telegraphic business, the public would be infinitely better served, while much disappointment would be spared to those who might be tempted by glowing prospectuses to invest in experiments which, if as successful as investors and promoters could desire, would still be far below the standard of perfection at present attained, and, if unsuccessful, would be attended with serious loss and disappointment to the investors as well as to the public.—*The Railway News.*

The Southern Telegraph Institute of Louisville a Humbug.

THE Southern Telegraph Institute of Louisville, we presume, has through advertisements, become pretty thoroughly known. It has been in existence about two years. It is now published by the Louisville papers as a grand swindle. C. W. Crozier, Jr., who has been a student there, passed through this city yesterday en route for his home in Knoxville. He says his experience with the concern cost him \$200. While he was there about 50 students were in attendance. The institution had proposed to teach the art in three months and furnish situations. He states that they did not pretend to fulfil the latter part of the obligation, and proved themselves incompetent to fulfill the first part. When this was discovered, about a month ago, Mr. Crozier says a party of the students had the proprietors arrested for obtaining money under false pretences, and placed under bond not to issue any more circulars or advertise their establishment. Mr. C. and three others also brought an action for damages. This is not yet decided. Many young men from various places have gone to that institution to learn the art of telegraphy—some from Texas and other States. It is a pity the outrageous swindle has not been long ago exposed.—*Nashville Union and American.*

A Fast Receiver.

EVERYBODY knows Eitemiller. Here's a story that is vouched for as an actual fact: One of the Chicago boys (we suppress his name from motives of delicacy), who prided himself he was some on the “salt,” got hold of Eitemiller one evening, with a big pile of Reds. After receiving a few, Eitey blaudly asked him to hoop them in. A few minutes later, getting impatient, he told the fast man to “leave out the day of the month—I know what day it is—‘To,’ and make no periods.” Not coming lively enough then, he said: “Don't say sig, I'll know when you get there.” Even this way didn't seem to suit, for he opened again and remarked: “When they are from Chicago, don't date them; and when they are for New York, leave that out, too.” After all this cutting, he finally said, “If you don't go ahead faster I'll fall asleep.”—*The Operator.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

An Admirer of Nettie Bronson.

BAY CITY, MICH., March 18.

TO THE EDITOR OF THE TELEGRAPHER.

“NETTIE BRONSON” has again been tempted to give us a communication in THE TELEGRAPHER, and, as usual, it is short and interesting. I thought it strange if her generous nature failed to respond to the many anxious individuals who have expressed themselves so kindly to her. All credit is due to that one who has showu

his good will in something so substantial and pleasing as the subscription for THE TELEGRAPHER. And through its columns may we hear from “Nettie” often! Still, we must not doubt the sincerity of “Elias” in offering to donate 25 cents. His heart was in the right place, and his generosity is only exceeded by his good looks (an actual fact). No doubt he did not wish to appropriate all the honors, and I presume that quarter of a dollar, if not already spent for tobacco—I forgot he never uses it—is carefully laid away in his pocket ready to put to a good purpose next year. If the other chap gets the start of him then, I'm no prophet. But “Nettie” don't take any interest in “Elias.” Besides the name sounding so very ancient, I rather think from his talk he has two or three intimate female acquaintances now, perhaps half a dozen, and if they are not “old maids,” I doubt not some of them are not so young as they once were.

“Elias's” suspicions are very strong that “Nettie Bronson” is a gentleman in disguise, and the bare possibility of such an outrageous fraud fairly makes his hair stand on end; but if he can only be persuaded that the signature is rightfully appropriated, I will venture to say that 25 cents will be nowhere next time. He'll do better than that if he has to go to the bottom of his pocket. I honor his motive, but counsel him to be moderate—it seems to be setting a bad example of extravagance. And, to pay him for his unjust suspicion, I hope “Nettie” will not accept of any testimonial he may make.

“Elias's” bump of courage is very strongly developed. He has the courage to say “no” when asked to take a segar. If I had a segar that I didn't want very badly myself, I might offer it to him. If I had one and had no particular desire to get rid of it, I should think myself very courageous to put it in his reach. Operators, I think, as a general thing, are quite liable to answer in the affirmative to all such questions as that.

As to that office, and “Nettie's” promise to accept me as a student. On second thought, I'm not sure that the getting of an office is a necessary condition to her taking me as a student. There might be lots of business, and I am confident I should require a great deal of attention. I also think I should make more rapid progress if there were no wires in the office at all. On the whole, I am positive I should prefer a studentship without any office. This may be what “Nettie” will call a little bit of selfishness. I hope not.

FRANKIE.

Not Talk but Action Needed.

LAKE SUPERIOR, UPPER PENINSULA, MICH. }
March 21. }

TO THE EDITOR OF THE TELEGRAPHER.

THE communication in THE TELEGRAPHER of the 14th inst., entitled “a telegraphic organization, essential to the welfare of the fraternity,” was very good. Some twenty-five or thirty just such communications have appeared in your columns, and have been read and digested by us all, but as far as I can see it don't help much, unless your correspondents will commence and establish the basis of such an organization. When once the good work is commenced there are thousands of us ready to lend a helping hand, and will work cheerfully and with a will to make it a success.

The subject has been sufficiently argued, discussed and agitated, now let us proceed to practice what so many of us have been preaching for the past year. An organization we must and will have if the brethren will only work together. “Crotzier” asks, “When will such evils as this have an end?” The answer to this question is, when we have an organization, and not until then. At present we are mere slaves to our employers, subject to their overbearing and domineering rule.

It is, indeed, time that we had an organization of some character, to protect us from the slanders and machinations of a clerk of superintendents whose only desire is to benefit themselves by curtailing our wages to the amount of our board bills. We have stood this sort of thing long enough, now let us all rise in our might and burst the bonds of slavery, for it is nothing else.

If you will give this space in THE TELEGRAPHER you will confer a favor on one who looks for better times and who is AN OPERATOR.

Consolidation of Competing Companies Practicable and Advisable.

TO THE EDITOR OF THE TELEGRAPHER.

THERE seems to be a lull with regard to telegraphs just at the present time, and telegraph managers as well as others are waiting to see what will turn up. The season of construction, reconstruction and extension of telegraph lines is at hand, and with the exception of the Southern Atlantic Company, which is pushing its lines towards New Orleans, there is little heard of internal telegraph projects for the future.

While waiting the movement of the waters, why would not this be the opportunity for effecting the consolidation of the lines and companies competing with the Western Union, which has been so persistently and consistently advocated by THE TELEGRAPHER? With such a consolidation on a fair and reasonable basis, the future of the competing companies would be assured.

It is evident that the projects for a Government telegraph monopoly are practically dead, at least for some years to come. The most sanguine of the advocates of such a monopoly concede the impossibility of inducing Congress to embark in the telegraph business. This bugbear being happily disposed of, there would seem to be nothing in the way of such a consolidation as has been proposed. Its advantages are apparent. In place of the present weak and divided councils, which leave the companies open to attack by the great telegraph company of the country, there would be a strong and powerful company which could fairly divide the telegraph business of the country. We need two independent telegraph companies in this country, and the sooner we have them the better.

These suggestions are thrown out for the consideration of the parties interested, not because they are novel, for they have often been presented in the columns of THE TELEGRAPHER, but in the hope of attracting the attention of the managers of the competing telegraph companies, who, as it is understood, separately admit the desirability of such a consolidation, and bringing to their notice the exceptionally favorable circumstances at present existing for making it.

COMMON SENSE.

On Behalf of The Telegrapher.

TO THE EDITOR OF THE TELEGRAPHER.

PERMIT me to compliment you on the decided and constant improvement which is manifested in THE TELEGRAPHER from year to year. Thus far the present volume has been a decided improvement on any which has preceded it, in my estimation, and, from the commendation which I hear on all sides, in that of others. I have been a constant reader of the paper from its first number down to the last issue, and would not be without it on any account.

I notice that the demand for the numbers of this volume has been so great that you are obliged to solicit the return of Nos. 391 and 392 from those who can spare them in order to complete files. This is a gratifying evidence that the paper is making its way against all adverse influences, and that it is appreciated. For one, I cannot understand how any intelligent telegrapher can afford to be without it, and yet in endeavoring to obtain subscribers we are met with all sorts of excuses. This ought not to be. As a practical telegrapher I feel a pride that we are represented by so able and creditable a journal. It is worthy of and should receive the active support of telegraphers everywhere. It certainly shall have mine so long as its present policy and ability are maintained. Let every telegrapher make it a personal matter to bring the paper to the attention of his or her associates, and, if possible, secure the addition of their names to its list as permanent subscribers. AN OLD OPERATOR.

A Cheap and Convenient Appliance.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE in the *Journal* of February 15th inquiry is made, “Is there any known appliance in connection with a relay to know when circuits are in use without adjusting?”

I would state through the columns of THE TELEGRAPHER that the Montreal Telegraph Company manufacture their relays with a polarized needle attachment for this purpose; but a cheap appliance and one which is convenient and attainable for all is a common compass, which costs from ten to fifty cents. This may be placed on either of the main line binding screws of the centre relay, or on the back corner of any relay. I would respectfully urge its adoption as far as practicable on all way wires in bad weather, as it avoids much breaking and ill temper. OLE.

Answer to Correspondent.

To B. F. SPEAR, San Francisco, Cal.—Letter and inclosure received. Mailed book and letter to you March 25. Last letter to you was returned by P. O., as not being able to find you. Be sure and get these.

THE West India and Panama Telegraph Company have received intelligence, through their engineer, Sir Samuel Canning, of the complete restoration of the section of their cable between Martinique and Dominica, thus reopening for traffic the whole of the lines from Cuba to Demerara. The interruption on the Cuba Company's cable is now the only obstacle to direct telegraphic communication with the West Indies, and it is hoped that this cable will be completed shortly.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, MARCH 28, 1874.

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A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
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Published Every Saturday,

AT

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TENTH VOLUME.

The Tenth Volume of **THE TELEGRAPHER** will commence with the number for SATURDAY, JANUARY 3d, 1874, and will close with the year.

All the popular features of the paper will be continued, and it will be improved from time to time, as opportunity shall offer.

THE TELEGRAPHER

has now, for nearly TEN YEARS, been maintained upon its merits, and without patronage or support, other than that derived from its legitimate business, for the past five years. (Previous to that time it was partially maintained by the National Telegraphic Union.)

The TENTH VOLUME commences under favorable auspices, and it may be said that it enjoys the entire confidence of the

TELEGRAPHIC FRATERNITY,

whose organ it is and will continue to be. It is a thoroughly

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J. N. ASHLEY, Publisher,

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A Dull Business Season.

THE business of the country continues to be to a considerable extent paralyzed. The improvement which was expected to be realized upon the opening of spring has not taken place, and from all quarters the complaint is general that business is restricted, and the usual activity incident to the spring trade is wanting. Enterprise is checked, money accumulates at the financial centres, and with a superabundance of loanable capital and funds seeking employment, there is little speculation done upon the Stock Exchange. Labor is only partially employed, and even now tens of thousands who, at ordinary times, would find plenty of remunerative employment, are still idle, and dependent upon charity for the means of livelihood from day to day.

One of the principal causes of this condition of things is the financial situation, and the delay of Congress in deciding upon a definite financial policy. For three months that body has debated upon the subject, and it seems absolutely impossible for our legislative Solons to arrive at any conclusion. Inflation and contraction, free banking and redistribution of the currency have been discussed in both houses of Congress until there would seem to be absolutely nothing further to be said in regard to either, and still no definite conclusion is arrived at. On Monday last, it is true, the House of Representatives passed an act legalizing the increase of the legal tenders or greenback circulation to \$400,000,000; of which \$382,000,000 has already been issued; but this has yet to be acted upon by the Senate, and when that body will conclude its interminable talk and take action is one of those things which it seems impossible to form a reasonable conjecture upon.

The action of the House we cannot but regard as unwise. It is not a lack of currency that the country is suffering from, but rather from a definite and settled financial policy. The only wisdom that we can recognize in the action taken is, that it has a tendency, so far as the House is concerned, to relieve the business community as far as it goes from the uncertainty which has so long existed as to a financial policy. The step taken is in the wrong direction, and if concurred in by the Senate, will still further postpone the time when this country shall again be placed upon a sound financial basis.

It is not the province of THE TELEGRAPHER to discuss financial questions, and our readers may ask why we depart from our usual custom now? The reason will be obvious upon a moment's reflection. The prosperity of the telegraphs of the country is intimately connected with that of the general business of the country. For many years the telegraph business has not been so depressed as it is at the present time. The telegraph lines are suffering from the present general depression in business, and must continue to suffer so long as this depression continues. Telegraph companies are compelled to limit their expenditures and economize wherever economy is practicable, and at the best, the pecuniary results are unsatisfactory. Naturally and logically this condition of things reacts upon telegraph employes, not so much in the reduction of compensation of those who are employed, for we have heard of no general reduction, but rather in the reduction of the demand for telegraphic labor. New telegraphic, as well as other enterprises, are suspended until the financial condition is changed. Those which are already established cannot be extended because capitalists have no assurance that such extension can be made to pay.

If, as now seems probable, there is to be a further inflation of our irredeemable currency, business will undoubtedly be stimulated for a while, speculation will be revived; and there will be a fallacious appearance of prosperity, in which the telegraphs will of course participate, until we are again brought up by the recurrence of the panic, which a few months since threatened to overwhelm the country in ruin, and from which we have already suffered so severely, and are still suffering. That in such an event this will come, is as certain

as that with the decline of the sun night will follow the day. If further inflation must come, however, and all the lessons of experience are to be ignored, the sooner it takes place, and the race is run, the better. The laws of business and finance are as immutable and unchangeable as the seasons, and all the talk of Congressmen and callous financiers cannot change them.

At any rate let us have some policy decided upon, and telegraph managers can then make their calculations for the future, and prepare for the ultimate and natural result of such policy. Almost anything will be better than the present condition of business.

We should judge from the rapid increase of telegraph schools that, notwithstanding the fact that there is now a considerable surplus of telegraphic labor, and even skilled operators find it difficult to obtain remunerative employment, the general impression was that telegraphy, as taught, or pretended to be taught, in these schools, was the assured road to competence. Perhaps the fact that other kinds of business are so depressed induces many to credit the lying assertions of the circulars of the proprietors of these schools in regard to the ease and certainty with which telegraphy may be acquired by any person, whether otherwise qualified or not, and the certainty with which, after a longer or shorter course of instruction by incompetent teachers, remunerative situations may be obtained. We do not write this with the expectation of diminishing to any considerable extent the patronage of these institutions. Their patronage, of course, comes from those who know nothing about the telegraph business and who are not likely to see THE TELEGRAPHER, or heed its warnings. We long ago became convinced of this fact, and while we have endeavored to discharge our duty in the premises, we have despaired of accomplishing anything satisfactory in preventing their success in obtaining patronage.

The present situation is not by any means encouraging to those who desire to enter the telegraphic ranks, and the interests of the telegraph would not suffer if there were no accessions to the number of telegraphers for the next year or two. Until there is a revival of telegraphic business, and a renewal of the extension of telegraph lines and facilities, there is absolutely no encouragement for any person not now in the service to enter it. All that we can do, however, or that our readers can do, is to make known the facts as generally and as widely as possible, and counsel those who are contemplating engaging in the business to either abandon their intention altogether and seek a living in some other avocation, or, at least, postpone it until the prospects are more encouraging.

Speculation in Western Union Stock.

THERE has been quite a lively speculation in the Western Union Telegraph Company's stock during the past two or three days, and the price has advanced to over 82. This has arisen from several causes. There has grown up of late quite a large short interest in the market, and things were in good shape for an active bull movement. On Tuesday last, it was positively asserted that the Western Union had acquired a controlling interest in the Atlantic and Pacific and Franklin Companies, and that these were immediately to be consolidated with the Western Union Company, and that, consequently, the most important of the opposition companies were to be wiped out, and the competing forces demoralized, and telegraphic competition practically destroyed. The reports of a pending dividend on Western Union shares were also very positive, and the market was further strengthened by the report that Commodore VANDERBILT was purchasing the stock largely.

The street evidently credited these rumors, and the shorts were frightened into covering, which of itself would advance the price materially.

The report in regard to the Atlantic and Pacific was, of course, a canard. There has been, as we are informed, no such sale of the stock of the company as would give a considerable or controlling interest to any new party, and it is somewhat difficult to understand why it should

be desired to sell except at prices considerably in advance of that at which transactions have taken place. The situation of the Atlantic and Pacific Company is a very good one. It has no debt, bonded or otherwise. There is a surplus of funds in the treasury both of the A. and P. and the Franklin companies. Notwithstanding the reduction of tariffs and the loss of the connection afforded by the Pacific and Atlantic Company, the business for the current month makes as favorable a showing as for the corresponding month of last year, which, in view of the depression in business generally, is a very good showing.

It is true that neither the A. and P. or the Franklin stockholders are receiving any dividends, but in this respect they are no worse off than the Western Union stockholders. If, by absorbing the Atlantic and Pacific, competition would be destroyed it might be an object for the Western Union to obtain possession, but even in that case there would be a greater extent of competing lines outside of the two than there is in it. On the whole, we are decidedly of the opinion that our speculative friends will find that the telegraphic monopoly millenium is not just yet at hand. As we are not in the confidence of the managers of the Western Union Company we cannot say what foundation there may be for the dividend which is so confidently predicted, but as the same story has been told at intervals for the last year or two, and no dividend is yet apparent, we doubt whether one is likely to be declared very soon.

The Success of The Telegrapher.

WITH this number of THE TELEGRAPHER is completed the first quarter of the present volume. The circumstances under which the new year commenced were not such as to afford a very encouraging outlook, and we had some doubts whether the paper would not suffer from the general business depression. Thus far we have been much gratified at the success which has attended the new volume. The paper seems to have become indispensable to our telegraphic friends, and its patronage has rather increased than diminished. Its prospects for the future are most excellent, and we shall be much disappointed if the present does not prove to be one of the most successful of the more than ten years which have passed since the paper was established.

We are endeavoring constantly to improve the paper in every practicable manner, and to constantly add to it such new, valuable and interesting features as may from time to time be suggested. The practical and scientific features of the paper were never so well maintained as at present, and our arrangements for the future are certain to constantly add to its value and interest in these respects. The assurances which we are constantly receiving of the recognition of the constant progress and improvement of the paper are most flattering.

While this is true, and we are exceedingly gratified to know that our efforts to make THE TELEGRAPHER a creditable representative of the fraternity are recognized and appreciated by intelligent telegraphers in all sections of the country, the circulation has not yet reached the proportions which, in view of the large number of persons engaged in telegraphic pursuits, it should do. We hope that our friends will bear this fact in mind, and exert themselves to add to the number of its readers. Its circulation should be at once largely increased, and might be if the friends of the paper would realize the importance of their individual and united exertions to secure additions to its subscription lists.

This week and for the next two or three weeks quite a number of subscriptions expire. We hope that most, if not all, of them will be renewed, and that their renewal will be accompanied by many additional subscriptions. Remember, that the more generous the patronage the better the paper can be made; and that, while we do not ask for an increase of individual contributions, the aggregate increase will enable us to give to each a much better and more valuable paper in return.

THE TELEGRAPHER is one of the established institutions of the country. We ask every telegrapher to aid us in making it one of the best and most useful. The present volume has had a good beginning, and we confidently rely upon the telegraphic fraternity to see that it continues to improve until its close, and, we trust, for many volumes yet to come.

The Popularization of Cable Telegraphy.

AS WILL be seen from a brief article which we reprint in another column from *The Railway News*, of London, the Anglo-American Telegraph Company have under consideration a plan to cheapen and popularize the cable telegraph service, which, if adopted, will no doubt prove important and beneficial. This is to make two classes of business, as is now universally done on land lines in this country. The business and other messages which are urgent and important, requiring instant transmission and delivery, to be charged present rates; and social messages, and messages which will not suffer from a few hours' delay, to be transmitted at the convenience of the company at about one quarter of the present rate.

When the cable which is contracted to be laid for the Anglo-American Company during the present season is in operation, that company will have four good cables available, and can transmit daily a much larger amount of business than at present, even if the speed of transmission should not be increased. That this would be a popular arrangement we have no doubt, and it would largely increase the number of messages transmitted by the cables. The management of the Anglo-American company would be wise to carry this plan into effect, or, at least, to give it a trial. It would, besides popularizing and increasing the patronage of the cables, relieve them of the pressure of business upon them during the business hours of the day, and keep them fully employed at times when some of them are now idle.

The Automatic Signal Telegraph.

ONE of the most important adaptations of electricity to insure safety from extensive conflagrations in cities and towns is the Automatic Signal Telegraph, which is being introduced in this city by the Automatic Signal Telegraph Company.

This system is the invention of Mr. W. B. WATKINS, of Jersey City, who was engaged for several years in perfecting it. We gave a description of this system in THE TELEGRAPHER of December 6, 1873. It is being rapidly extended in this city, the demand for it taxing to the utmost the ability of the company to establish circuits, and connect business and other edifices with it. With this system it is almost impossible for a fire to obtain any considerable headway before the fire apparatus is on the spot, and the conflagration suppressed. A comparatively slight increase of the ordinary temperature of a room or building in which the thermostats are placed at once automatically notifies the firemen or watchman of an incipient conflagration, and automatically registers the location of the fire. With this system generally introduced, it becomes almost impossible for a fire to extend beyond the spot in which it originates.

Mr. JOSEPH E. FENN is the General Superintendent of the company in this city, and personally superintends the establishment of the circuits, and a very busy and active time he is having in accomplishing it. His experience and ability insures the work being done in the most thorough and effective manner.

Mr. JOHN C. BEALS is the President and Manager of the New York Company, which has ample capital and facilities for the business.

Arrangements have already been perfected for the introduction of the system in Boston, and are being completed for its speedy introduction in other places.

Like most inventors Mr. WATKINS had considerable difficulty in getting his enterprise started, but its success is now assured, and we congratulate him and the company on the brilliant prospects before them.

Seasonable Suggestions.

THE winter season may now be considered as about over, and the time has come for spring freshets and the usual upheavals of telegraph poles, and development of faults in telegraph lines and insulation which the frosts of winter have heretofore concealed. Frost is a good insulator, as probably most of our readers are aware, and conceals difficulties and defects while it continues, which would otherwise be very troublesome and annoying.

We do not propose to make a long discourse on insulation, but merely to suggest that attention to telegraph lines at this time and within the next two or three weeks will save time, trouble and money during the coming season. Every telegraph superintendent and manager should have his lines thoroughly examined and put in good condition now. Don't wait until the condition of the wires and insulation becomes such as to excite involuntary profanity on the part of the operators, or necessitate the sacrifice of business from inability to transmit it with promptness, or injure the reputation of your lines by undue and vexatious delay. Wise economy will dictate the spending of a few dollars now, if necessary, rather than somewhat later the expenditure of much time and money in making good the defects which a little present attention will obviate or prevent.

The public generally have become accustomed to reasonable promptness in the transmission of telegraph messages and in the receipt of replies when required, and will not be satisfied with having their business forwarded by express and the answers returned by mail.

Personals.

Mr. GEO. ARMSTRONG, late of the St. Louis Western Union office, has accepted a position in the Cincinnati, Ohio, office of that company.

Mr. W. S. DYER, formerly of Elmira, N. Y., has been appointed night operator in the Superintendent's office of the Central Railroad of New Jersey, at Elizabeth, N. J.

The address of I. A. WRIGHT, who was agent and operator at Centreville, Crawford Co., Pa., in 1866-67, may be learned by addressing Manager A. & P. Telegraph office, Buffalo, N. Y., giving real name.

The Telegraph.

By Cable.

THE NEW UNITED STATES DIRECT CABLE.

LONDON, *March 24*.—Messrs. Siemens Brothers announce that their new steamship Faraday, built specially for the purpose of laying cables, will commence, on the 15th of next month, to take on board the cable which is to be laid direct to the United States.

CABLE COMMUNICATION RESTORED.

HAVANA, *March 24*.—Communication by cable between Havana and Santiago de Cuba has been re-established.

THE PORTUGUESE CABLE.

LONDON, *March 25*.—The steamship Great Eastern will start in August to lay the Portuguese telegraph cable from St. Vincent, in the Cape Verd Islands, to Pernambuco, Brazil.

The Dominican and Martinique Cable Reopened.

THE cable between Dominica and Martinique has been repaired, and messages can now be forwarded direct. The steamer "Kangaroo" effected the relaying of this portion of the telegraph wire, and has since been engaged testing the line between St. Lucia, St. Vincent and Barbadoes, and, in all probability, will continue this work up to Demerara. The Brazilian steamer "Vital de Oliveira" has been engaged in taking soundings for laying submarine cables between Brazil and the West Indies, for the Western and Brazil Telegraph Company.

When Columbus, O., wants a better man to work with, he sends a message to the chief, requesting him to "infuse more ambition into that hairpin receiving special."

Foreign Telegraphic Notes.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended February 28, 1874, was 329,245, an increase on the corresponding week of last year of 28,114.

The traffic receipts of the Great Northern Telegraph Company for the month of February last amounted to 288,094f., and in the corresponding period of 1873 to 189,095f. On the European lines the receipts for February amounted to 173,235f., and in 1873 to 109,415f. ; and on the China and Japan lines for February to 114,859f., and in 1873 to 79,680f.

The screw steamer Gomos, 2,314 tons, having on board 593 knots of telegraph cable, left the Thames on Thursday, March 5th, for Rio de Janeiro. The cable forms the remaining portion of that contracted for by Messrs. Siemens Brothers for the Platino-Brazileira Telegraph Company to connect Rio de Janeiro with Uruguay, the first part having left England a fortnight ago in the steamer Ambassador.

Telegraphic and Electrical Brevities.

Mr. PIERCE, of Massachusetts, offered a resolution in the House of Representatives at Washington, Monday, to guard against the divulgement of telegraphic secrets. Under the Morse system there is not a secret in private despatches. In other words, a Morse operator can stand by a telegraph instrument and read the despatches that are going or coming. Mr. Pierce was an earnest opponent of the confirmation of Mr. Simmons as Collector of the Port of Boston, and it seems that all his telegrams to his friends in Boston were, within an hour of their transmission, known to another member of Congress, who was Simmons's most earnest advocate. Mr. Pierce wants to prevent a recurrence of this matter, and hence his resolution.

Two Chinamen are studying telegraphy in the San Francisco, Cal., Western Union Office. They are to have charge of a hand office in Chinatown, where the messages of Chinese merchants may be translated, and where the telegrams may be forwarded to the main office in California street for transmission to their final destination.

[From The Operator.]

Stage Telegraphy.

I WAS much amused one night in witnessing "Across the Continent," as played by Oliver Doud Byron in the principal theatres throughout the United States. One of the principal scenes being Station No. —, on the Pacific R. R., Oliver plays the part of station agent, ticket agent, freight agent, baggage master, switchman and telegraph operator. During the play the station is attacked by Indians, and Oliver having a small party with him, sends to the next station for help, and at the critical moment the train thunders into the station with a regiment of blue coats, rescuing the party. The amusing part of it to a telegrapher is where Oliver telegraphs for help. He places the instrument on a barrel, the wires lying along the stage floor; rolls up his sleeves, takes hold of the key and works it as if he was sawing a cord of wood, making a lot of dots all he could telegraphically; then closes the key and waits for a reply, which comes from the operator behind the scenes, thusly: "Say, Oliver, let's take a drink."

Oliver seizes the key again in a still more desperate manner, throwing his whole soul, boots and all, into his efforts, and again waits for a reply. It comes slow, but sure, in first class college Morse: "Oliver, give us a rest—I'm thirsty."

Oliver closes the key, satisfied that he has done his duty and saved the party from the hands of the ruthless savages, and that the train will be on time.

QUILP.

Our Telegraph Operators.

We have a class of people among us whose services are an hourly necessity; who serve the public by day and night. Intelligent, courteous and civil in manners and speech, they are invaluable. But there is one point in their favor upon which we have not yet touched, viz., their fidelity to their trust. In this day of speculation, jobbery, rings for robbing State and National treasuries, defaulting cashiers, betrayals of public and private trusts, it is most pleasing to turn to one class who are sans reproche. We have yet to learn of a single instance of a telegraph operator dishonoring the profession, and yet secrets worth millions of dollars pass daily under their observation.—Norristown (Pa.) Independent.

Good impulses are naught unless they become good actions.

The country for the telegraph builders—Pol-and.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Table with columns: MARCH, WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows of stock prices for dates 19, 20, 21, 23, 24, 25.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended February 10, 1874, and bearing that date.

No. 147,311.—ELECTRIC TELEGRAPH.—Thomas A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C. Case 82. Application filed July 29, 1873.

States that the static charge of a line proceeds in both directions from the centre of resistance of the line, and that at such centre the tension of the static or extra charge is zero, and that if the receiving instrument be placed at that point there will be no tallings. Makes such point by putting in a resistance between instrument and earth equal to resistance of line and instrument.

An artificial line between the receiving instrument and the earth to balance the resistance and static charge, or nearly so, at both sides of the receiving instrument, substantially as set forth.

No. 147,312.—PERFORATOR FOR AUTOMATIC TELEGRAPHY.—Thos. A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C. Case 75. Application filed July 29, 1873.

General features as in Edison's patent of December 5, 1871, improvements being in feeding devices, the arms 13 taking against cam slides c, and thereby limiting motion of rock shaft v' operating the feed mechanism. Spring arm t2 taking in rack v' lifts presser foot off paper when feed mechanism is moved up, releasing it to grasp paper on back stroke.

1. The stops 13 and cam arms 12 upon the shaft v', in combination with the finger keys a a', slides c, rollers 15, and paper feeding mechanism, substantially as and for the purposes set forth.

2. The spring arm t upon the pawl u, in combination with the rack v and reciprocating mechanism, substantially as set forth.

No. 147,313.—CHEMICAL TELEGRAPH.—Thomas A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C. Case 74. Application filed July 29, 1873.

Instead of single electro-magnet in a shunt circuit to the receiving and transmitting instruments, as in his patent No. 135,631, a number are employed, with a switch for throwing more or less into circuit, as in the case of the ordinary rheostat. Uses ordinary rheostat in connection with the series of magnets.

1. A shunt or derived circuit at the transmitting station, into which an adjustable resistance and one or more electro-magnets are introduced, as and for the purposes set forth.

2. The combination, with a chemical telegraphic receiving instrument, of several electro-magnets and a switch, k, to connect more or less of said magnets in a shunt circuit, for the purposes set forth.

No. 147,314.—CIRCUIT FOR CHEMICAL TELEGRAPHS.—Thomas A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C. Case 77. Application filed July 29, 1873.

Opposing batteries at each end of line, transmitter and receiver being placed in short circuits to their respective batteries. The short circuit of transmitting battery being broken, its current is forced over line, neutralizing effect of receiving battery. Roller wheel falling in a perforation makes the short circuit, allowing receiving battery to act.

The circuit 4 from the battery d, in which the receiving instrument b is placed, in combination with the opposing line circuit 2 and the shunt circuit 3 at the receiving instrument, in which are placed the transmitting instrument and battery, as and for the purposes set forth.

No. 147,352.—TELEGRAPH APPARATUS.—Henry Van Hoovenbergh, Brooklyn, N. Y. Application filed August 16, 1873.

Call bell driven by clockwork released by an electro-magnet. Current derived from a magneto-electric machine in which the permanent magnet is fulcrumed and forms the operating key.

1. The permanent magnet e, set to swing upon the fulcrum b, and movable by the handle or knob, in combination with an electro-magnet, the cores of which are magnetised by induction, and from which the permanent magnet is separated by the movement thereof, substantially as set forth.

2. The cam wheel o, fingers r r', and armature k, in combination with the electro-magnet h, clock work n, hammer l, and belt m, substantially as and for the purposes set forth.

Died.

WHYTE.—March 16, 1874, Mr. R. H. WHYTE, agent and operator at Peterson Station, Utah, of the Union Pacific Railroad, of consumption.

Born.

BAILEY.—At Santa Cruz, California, a son to Mr. J. R. BAILEY Manager of the Western Union Telegraph office at that place, and formerly of the Northwestern Telegraph office at L'Anse, Lake Superior, Michigan.

WILLIAM BROWNLEE, Dealer in CEDAR TELEGRAPH POLES. OFFICE FOOT OF LIBERTY STREET, DETROIT, MICHIGAN.

SPECIAL NOTICE. That "THE BEST IS ALWAYS CHEAPEST" is demonstrated by the unprecedented demand which has arisen for our

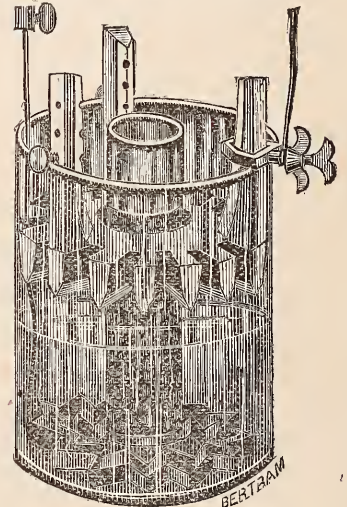
EXCELSIOR TELEGRAPH APPARATUS for Students and Amateurs. The custom introduced by us of making Agents of managers and operators, and sharing the profits from the sales of these Instruments with them, has also assisted in increasing our sales to such an extent that we have been compelled to enlarge our facilities for their manufacture.

We are now prepared to furnish these unrivalled Amateur Instruments, with or without Office Outfits, in any quantity and at a moment's notice. Our Agents may now send in their orders as rapidly as they please, and can rely upon their being promptly executed. Prices as heretofore.

Instrument complete, Key and Sounder..... \$6 50 Instrument with Office Outfit..... 7 50 Two Instruments and Outfits..... 14 50

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Acknowledged to be SUPERIOR to any other for Telegraph purposes. Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

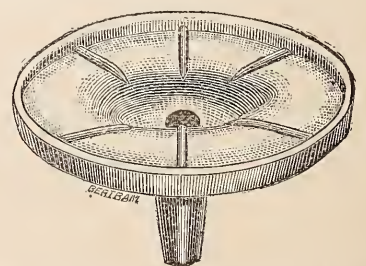
It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used. Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival. All kinds of Battery and Battery material for

WATTS & CO., 47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

PATENT BATTERY INSULATOR.



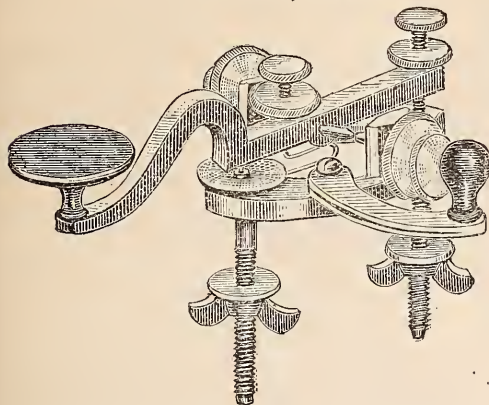
"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

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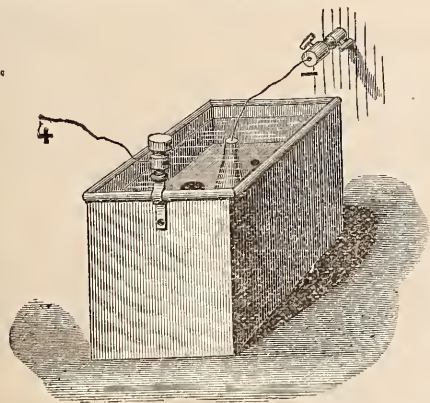
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

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OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
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at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

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OUR PROFITS HAVING BEEN AMPLE,
WE OFFER OUR CUSTOMERS THE BENEFITS OF THE RECENT REDUCTION
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ALL WHO NEED
TELEGRAPH INSTRUMENTS and SUPPLIES,

IN
Large or Small Quantities,
WILL CONSULT THEIR OWN INTERESTS BY PURCHASING FROM US.

SEND FOR OUR NEW PRICE LIST.
A Special Discount given on Cash Purchases.

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TELEGRAPHIC, ELECTRICAL AND MEDICAL APPARATUS.

Agents for KIDDER'S MEDICAL APPARATUS.

- " " AMERICAN COMPOUND WIRE.
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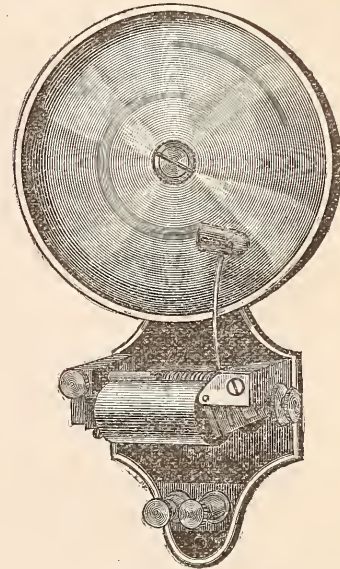
IMPROVED AMATEUR SOUNDERS.

- AN EXTRA FINISHED AND GOOD WORKING SOUNDER, No. 3.....\$4 00
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Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

Special attention given to REPAIRS and MODEL WORK.

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Manufacturer of
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Between Fulton and John Streets, NEW YORK.



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

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Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

- The Platina Points are large and hard.
- Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00
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- Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00
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Send for Illustrated Circulars.
The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

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MANUFACTURERS AND DEALERS IN
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A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS
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PATENT ELECTRIC WATCH-CLOCK
THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,
At prices which defy competition.

Batteries of Every Description,
At unusually low prices.

Battery Carbons all sizes, with Improved Connection
MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS,
AND PRICES EXTREMELY LOW.

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A MERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

Is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Montreal, Canada,
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New Haven, Conn.,
Newark, N. J.,
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Providence, R. I.,
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Rochester, N. Y.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the
apparatus may be distributed in a combination of circuits, and
the entire system successfully worked, without the constant per-
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Second—The Automatic Signal Boxes.

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bells.

Fourth—The Electro-Mechanical Gong Striker,
for hose and engine houses, by means of which the location of
the fire is instantaneously communicated to the members of
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These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by
the Proprietors of these systems of

FIRE ALARM

AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of
practical use, and that the efforts which have been repeatedly
made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to
adopt other systems having demonstrated their insufficiency
and unreliability, and resulted in their abandonment, and sub-
stitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the
original *FARMER & CHANNING PATENTS*, one of the most
important of which has just been extended for seven years, and
during the past seventeen years have spared no expense or effort
to secure improvements, and the Systems are now coveted by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have
adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little ex-
pense, compared to the benefit which it confers, that even small
communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of
the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POS-
SIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruc-
tion, and the number of lives which have been preserved
through the general adoption of this system, throughout the
UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for
any considerable length of time, they have been enormous, **THREE**
CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its in-
troduction into their localities is cordially invited, and
their efforts will be duly appreciated and
compensated.

Any information desired in regard to the above
system will be cheerfully and promptly furnished
upon application at the office.

A pamphlet, setting forth more fully its advantages and
superiority, has been printed, and will be supplied to Municipal
Authorities and others interested in Fire Alarm and Police Tele-
graphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These Instruments are now made in two different styles, at
\$120 and \$135 a set, consisting of two Relays, two Sounders, two
Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-
locked connection between any number of wires, occupying for
each different connection only one square inch of space, and
though made of the largest size, not subject to the warp and
contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three
years, an Insulated Wire which can be buried in the earth or
exposed to rain and sun, or to the vapor of acids, without injury.
Professor SILLIMAN, who has exposed it to the most destructive
agencies, finds that it remains uninjured in an atmosphere of
ozone, which would destroy gutta-percha in a few hours. It
exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article
for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will
exceed, in insulation for submarine purposes, ANYTHING
HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and
size of cable, which will be found to compete with any other
construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**,
with Patent Platina Connection, introduced by us eight years
since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**,
now extensively used in this and other cities for private lines,
being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that
will work practically with a single **DANIELL** cell, a **BATTERY**
that does not require to be taken down but once a year, and the
very best **MAIN LINE SOUNDER** made

Our **CATALOGUE**, embracing a large amount of new matter
and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.
 This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.
 This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.
 These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.
 Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
PRINTING TELEGRAPH INSTRUMENTS
 manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES
 constructed in the best and most substantial manner, and on reasonable terms.
 Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer.
 For further particulars, terms, &c., apply to

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AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.
 Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
 CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.
 And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.
 Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring
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 FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.
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 OFFICES:
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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH
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 It has already been extensively adopted and has invariably given entire satisfaction.
 They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,
 which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS
 of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
ETC., ETC.,
OF ALL KINDS.
 All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
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EVERY DESCRIPTION,
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 NEW AND SUPERIOR PATTERNS OF

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 These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.
RELAYS,
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REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as
BATTERIES, INSULATED WIRES, CHEMICALS
 of all kinds, etc., etc.
THE NONPAREIL TELEGRAPH INSTRUMENT,
 For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
Bradley's Apparatus for Electrical Measurement.
 We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,
 of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.
 Sole Agents for the
EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.
 Descriptive Circulars and Price List forwarded upon application to
F. L. POPE & CO.,
 (P. O. Box 5503.) **38 VESEY STREET.**

REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL TELEGRAPH APPARATUS,
 For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
 Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00

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F. L. POPE & CO.,
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 MANUFACTURERS OF
UNRIVALLED MORSE INSTRUMENTS
CHAMPION LEARNERS' APPARATUS,
 with Complete Instructions, Battery, Wire, etc.,

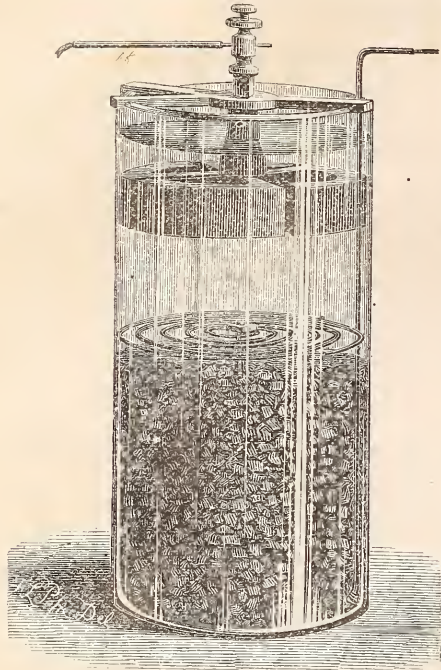
GIANT SOUNDERS,
Improved Curved Keys,
 Batteries and Supplies of every Description.
 Send for Circulars and Catalogue.

DR. L. BRADLEY,
 No. 9 Exchange Place,
 JERSEY CITY, N. J.,
 Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS
 FOR
ELECTRIC MEASUREMENT,
 Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.
 Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
 Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his
CELEBRATED HELICES
 WHICH ARE OF
Naked Copper Wire,
 So wound that the convolutions are separated from each other by a regular and uniform space of the 1 800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1 150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionably stronger magnet, while the resistance will be the same.
 These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY AT THE **CINCINNATI INDUSTRIAL EXPOSITION OF 1873.**

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION, and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY, or for any purpose requiring a uniform, powerful and constant current.

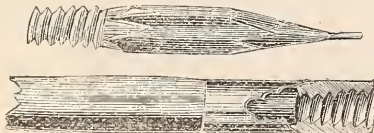
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. *Send for Circular.*

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.90.

Agents for towns, and counties wanted.

GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARFON, Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

No. 220 KINZIE STREET, CHICAGO.

TELEGRAPH, WIRES, INSTRUMENTS,
BATTERIES, TOOLS,
INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND UNION BRAND EXTRA QUALITY. JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS. KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE. CABLES TO ORDER.

Western Electric M'g Co., Chicago.

LECLANCHÉ BATTERIES.

CAUTION.

All persons are hereby notified that Batteries infringing upon our patents are in the market (some of them nearly worthless). The public are warned against using any such infringements, as in every case the guilty parties will be prosecuted to the fullest extent of the law. The genuine Batteries have the words "Pile Leclanché" on the carbons and glasses. Any information concerning such infringements will be thankfully received by the

LECLANCHÉ BATTERY CO.,

No. 40 West 18th Street.

New York, October 11, 1873.

THE ONLY PERFECT MAIN LINE SOUNDER.

Our WRECKING INSTRUMENT is still popular with managers of Railroad Telegraphs who find an attractive combination, giving loud sound without materially increasing the resistance beyond the standard of their relays.

We have rewound some of the old Box Sounders, in which we found the helices to have a resistance equal to 400 and 450 ohms. None of our Wreckers have over 175, while 150 is the standard.

Brass or nickel plated always on hand. No local required. Always ready for temporary offices. Just what is wanted for officers' cars.

Two sizes black walnut cases. Handsome leather cases, velvet lined, to order. See our advertisement in other columns.

WATTS & CO., Baltimore.

THE BEST TELEGRAPH MATERIAL IN THE WORLD

IS SUPPLIED BY

L. G. TILLOTSON & CO.,

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MANUFACTURERS, DEALERS and IMPORTERS

OF

TELEGRAPH MACHINERY, SUPPLIES

AND

Line Equipment of every Description

MATERIAL AND INSTRUMENTS

always on hand, for the equipment of lines of any length, at a moment's notice.

We furnish first class goods at low prices. Liberal arrangements made with Superintendents, Contractors and Builders of Telegraph Lines.

Registers.....	\$38 00 to \$45 00
Spring Registers.....	47 50
Relays.....	14 00 to 18 00
Sounders.....	3 50 to 7 50
Keys.....	4 00 to 6 50
Main Line Sounders.....	14 00 to 18 00
Combination Sets.....	20 00 to 30 00
Galvanometers, \$7 00 upward.	

RATTLE TELEGRAPH SOUNDER, \$3.50.

POCKET INSTRUMENTS, Nickel Plated, in Hard Rubber Cases, 1 1/2 x 2 x 5 inches.

CUT-OUTS, Plug, Peg or Button, with or without Lightning Arresters, for one, two or more Lines.

JONES' PATENT LOCK SWITCHES, the best and cheapest in use, with or without Lightning Arresters.

PEG or PIN, CULGAN, REPEATING, GROUND, LOCAL, BATTERY and SINGLE BUTTON SWITCHES.

LIGHTNING ARRESTERS for any number of wires, of most approved patterns.

ELECTRO-MAGNETS, PERMANENT MAGNETS, APPARATUS for STUDENTS and AMATEUR TELEGRAPHERS ELECTRIC MOTORS, PRINTING and DIAL INSTRUMENTS.

ELECTRICAL ANNUNCIATORS, FIRE and BURGLAR ALARMS, ELECTRO-MEDICAL INSTRUMENTS. RHUMKORFF COILS, from 1/4 to 10 inch spark.

GEISSLER'S TUBES, from \$1.00 upwards ELECTRICAL CALL AND ALARM BELLS in great variety, from \$6.50 upward.

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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, April 4, 1874.

Whole No. 403

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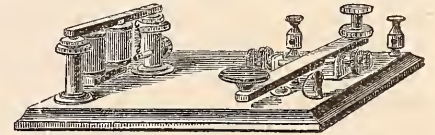
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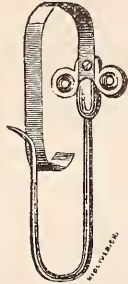
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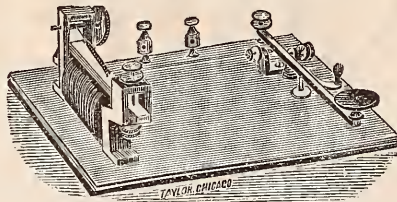
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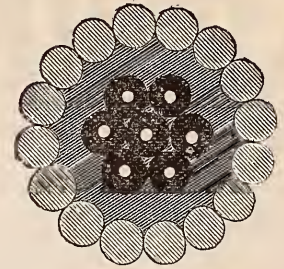
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, APRIL 4, 1874.

VOL. X. WHOLE No. 403.

Original Articles.

The Criticism of the Annual Report of the Atlantic and Pacific Telegraph Company, by the W. U. Official Organ.

By FAIR PLAY.

IN the official journal of the Western Union Telegraph Company for March 2d, appeared what purported to be, and probably was intended to be, a criticism of the annual reports of the President and Executive Manager to the stockholders of the Atlantic and Pacific Telegraph Company. This pretended criticism is so unfair, and written with such an evident intention of misrepresenting the reports, and giving a false and erroneous impression of the business and condition of the company, that it is eminently proper that the official critic should be criticised in turn, and the *animus* of the critic shown up.

In the first place, the pamphlet which is criticised is not "professedly made up of the reports of the President, the executive manager and the treasurer," nor is the omission of the treasurer's report so unfortunate as the critic would have us believe. The omission is fully explained—from the inability to prepare in time a complete statement of the business of the company, and the financial results for the year. It was in view of this fact that the proposition was made in the report of the President to change the time of the annual meeting from January to April. Perhaps, if the critic had chanced to recollect that, while the annual meeting of the Western Union Telegraph Company is held in October, the report of the business of the company is made only to the 30th of June preceding, he might have found nearer home a satisfactory solution of the doubts and misgivings which, apparently, so severely trouble him.

Having disposed of this omission, the reports which are published come logically under consideration. Naturally the official critic discovers a considerable collection of mare's nests in them, which he proceeds to unveil for the delectation of the Western Union Company and his readers. Through nearly two columns a labored attempt is made to demonstrate obscurity in the statements of the President and executive manager of the Atlantic and Pacific Company, and to convey the impression that either the writer of those reports intentionally so presented the facts to the stockholders as to disguise the true condition of the company and its business, or that they are naturally so obtuse as to be incapable of presenting them clearly and intelligently.

The report of the executive manager, which was printed in full in THE TELEGRAPHER for March 7, would appear to the common intellect, not befogged by too near a location to the executive office of the Western Union Co., as sufficiently explicit in everything except that omission of the financial accounts, which had not at the time been completed for the year.

In the President's report the Atlantic and Pacific Company is justly congratulated on the continuation of the advance in prosperity, which in the previous year had relieved the company of the heavy debt that had hampered it. It may serve to amuse the writer, and those for whose gratification he writes, to endeavor to obscure the language of the report in this respect, and make it appear inconsistent and illogical, but there is nothing in the language used or the literary construction of the paragraph to warrant it. The language of the report is as follows:—"The last official report to you, submitted at the annual meeting in this city, January 29, 1873, reviewed the important features in the company's history for the year 1872, in which this organization, then for the first time relieved of a heavy debt, had made rapid advances in increase of lines and material prosperity. I am happy to state that the year just closed has shown a continuation of the prosperity then inaugurated," etc. This point is, perhaps, an immaterial one, but it has been noticed to show the unfairness and purposed misrepresentation which characterize the whole article. The actual reason for the President's congratulations is plainly and unmistakably in the fact that, notwithstanding the very material reduction of tariffs in July, and the loss of business in consequence of the panic in September, the encouraging prospects with which the company began the year just closed; appeared to him and to any candid observer just as bright and encouraging at its close.

The critic, who has perhaps been studying up the history of the Western Union Company and its various consolidations and extensions by absorption of other lines and companies, is, perhaps, naturally troubled in regard to the terms upon which the controlling interest in the Franklin Company has been obtained by the Atlantic and Pacific Company. In view of the enormous fortunes which have accrued to a number of the manipulators of the Western Union Company heretofore, through their connection with these purchases and consolidations, and the well known dark and mysterious manner in which some of them at least have been effected, and the immense personal pecuniary benefit resulting therefrom, such suspicions are, perhaps, not to be wondered at. If the writer had only a little further considered the President's report, he might, perhaps, if desirous of doing so, have found some relief in the statement contained in the same paragraph, that the exchange of the Franklin stock by the individuals who purchased it is fully set forth in the minutes of the company. To these minutes, as the writer should know, any stockholder of the company can have access as his legal right, and through them ascertain just how badly the company has been victimized for the personal benefit of those who advanced the large sum required to obtain a controlling interest in the Franklin Company.

The criticism of the language and punctuation of the concluding paragraph of the President's report is so hypocritical and strained as to call for no reply. This paragraph states clearly and intelligibly a policy which has been decided upon of using, as they are realized, the available earnings of the company in extending the lines, etc. If it means anything this paragraph can only be construed as announcing a policy which, while the system is incomplete, must be regarded as a wise and proper one of devoting the surplus earnings or profits to the extension of the lines and improving the facilities of the company.

It may not be out of place in this connection to refer briefly to some of the deficiencies in the last report of the President of the Western Union Company. For instance, it is stated in that report that on June 30, 1873, that company operated 65,757 miles of line and 154,471 miles of wire. The legitimate inference from this statement would be that the company owned that amount of lines and wires. On the contrary, it is known that a considerable extent of these lines are merely leased by the Western Union Company. The report fails to inform the stockholders how much of this property is actually owned by the company. In view of its enormous nominal capital this must be regarded as a very noticeable omission. Again, the report gives no information in regard to the amount of rent paid for leased lines, which is another noticeable omission. Is this included in the operating expenses? Again, no distinction is made between the lines owned by the company and those which are operated in connection with railroads and entirely or partially owned by the railroads. A critical examination of that report would develop other deficiencies and omissions, which should suffice to cause the official organ to be careful in making imputations and insinuations in regard to its competitors.

In criticising the report of the executive manager of the Atlantic and Pacific Company the official organ attempts to be facetious—especially in regard to the calculation of what the receipts of the company on its business would have been if the tariff had averaged fifty-one cents per message. The disingenuousness of this criticism is apparent from the omission of the qualification which is made in the report, that the fifty-one cents per message was the rate received the previous year, before the great reduction in tariffs had been made. An examination of Western Union reports would have shown the critic similar statements, based on similar conditions. It is a legitimate method of arriving at an accurate conception of a corporation's comparative prosperity.

The real advance of the Atlantic and Pacific Company is shown by the fact, which is carefully omitted in the review, that, notwithstanding the reduction in tariffs, and the depression of business consequent upon and following the panic, there was an actual increase of receipts over the previous year of \$32,504 49. It may, perhaps, gratify the critic and the Western Union managers to know that, notwithstanding the operation of the causes mentioned and the additional loss of the business derived from the connection with the moribund Pacific and Atlantic Company, the receipts of the Atlantic and Pacific Company for March, 1874, exceed those of the corresponding month of 1873. The critic is, in this connection, referred to page 9 of the last report of the President of the Western Union Telegraph Company, where exactly the same principle of mathematical comparison above referred to is adopted.

This criticism of the Western Union official critic has already grown to such a length that it will be necessary to close with an allusion to only one point additional. The most miserable and despicable resort of any, even an interested critic, is the perversion of a writer's language to suit his own ends. This, and

nothing less, is precisely what is done in the article considered. Reference is made, of course, to the perversion of the language of the report in regard to completing the Atlantic and Pacific system by extensions and additional facilities. The language of the report is certainly sufficiently clear and explicit, and, to avoid misconception, it is here quoted *verbatim*: "To complete such a system it will be necessary to reach New Orleans, Galveston, Louisville, Memphis, Nashville and St. Louis, which, with additional cross and lateral lines, to be acquired generally without *monied* expense to the companies, will enable us to build up a business which cannot fail to yield a handsome profit."

The writer misquotes the paragraph, supplying by a sneer, the actual language of the report, and comments upon the figment of his own brain as if he believed his attempted ridicule could react upon the Atlantic and Pacific Company in such a way as to annihilate the corporation, and cover with confusion its officers and managers.

[From *The Telegraphic Journal*.]

Light versus Heavy Cables.

A SETTLEMENT of this much vexed question seemed at hand, and, provided all went well, we expected to hear of the submersion of a light cable of the latest improved type before the autumnal gales of the present year had set in. In consequence, however, of the insufficient pecuniary support accorded to the enterprise, the promoters of the Light Cable Company have, for the present at least, given up the idea of laying a new cable, and the question will remain an open one.

Although the leading engineers have, we believe, hitherto taken a decidedly adverse view as to the practicability of laying and maintaining a light cable, yet the fact that such thoroughly competent and experienced men as Sir Samuel Canning and Mr. Robert Sabine had undertaken the engineering work for the company is a sufficient guarantee of the possibility of completing a cable of the light type.

The causes which have hitherto delayed the submersion of a light cable are not far to seek. Primarily the reason seems to be that no sufficient proof has as yet been applied to show the durability of hemp, tarred or otherwise, when exposed to the continued action of sea water for a lengthened period. This doubt is now considered to be at rest, and it is confidently stated that tarred Manila hemp is practically indestructible in sea water. Nevertheless, this indestructibility has been disputed by some men eminently qualified to give opinions on the subject—Sir James Anderson among others.

The recovery of a portion of the 1858 Atlantic Cable last year, from midocean, in good preservation after a submersion of sixteen years, is certainly an argument in favor of light cables, but it is also favorable to the iron sheathed type of cable; for the iron wires, as well as the hemp, were found in good condition.

Provided the core of a deep sea cable remained uninjured for an indefinite period of time when once submerged, the perishability of the protecting sheathing would be a matter of small importance. But although it is said that no disturbing influence exists at the deep sea bed, yet experience has more than once shown that no cable can be relied upon to remain sound at great depths, even when submerged in an apparently perfect condition.

Whether this liability to injury is owing to the chafing of the cable against rocks whose existence is unsuspected in midocean—the attrition of the cable against the rocks being occasioned by currents, or to imperfection in manufacture—remains to be shown. That rocks may exist at the bottom of the Atlantic bed seems possible, when we consider the strange freaks which Nature sometimes exhibits in placing huge boulders in the middle of an open prairie, without anything to account for their being there. If such rocks exist, it is easy to see that an iron sheathed cable may bear a good deal of chafing without injury, under which a hemp covered cable would fail. It is, however, quite possible that the faults which have developed themselves after a time in the different ocean cables have been due to imperfection in manufacture. Not traceable when the cable was lying in the factory, these may have been discovered only when the cable was submerged and subject to the enormous pressure of water above it for some time. Such imperfections might be found out by the exercise of greater care in testing, and by a greater refinement in the present system, which in principle, however, seems to be all that could be desired.

As regards the mechanical strength of an iron, compared with a hemp covered cable, the balance is wholly in favor of the former, for iron possesses some 25 times the tenacity of hemp; and even taking into account the loss of strength due to the weight of the wire in deep water, an iron wire 2½ miles long or thereabouts, when immersed perpendicularly in the ocean, would still bear 16 or 17 times as great a strain as a rope of hemp would of an equal diameter. But there are causes which render an iron sheathed cable more liable to

facture than a hemp one when being laid. One of these is due to the momentum which an iron sheathed cable acquires when running out of the ship. This momentum is very great, in consequence of the weight of the cable; and any sudden check which might arise, either from some hitch in the paying out machinery, or from a sudden lift in the stern of the ship, would throw a very severe strain upon the cable. With a light cable this extra strain would be quite inconsiderable, as the momentum which it could acquire would be but small, and it might be jerked suddenly with but little danger of fracture. It is evident, however, that when a continuous pull is exerted on the cable through its becoming fast jammed in the machinery, whilst the ship is running, the iron sheathing would have the advantage.

One of the great disadvantages of iron sheathing is the liability of broken ends of wire to become forced into the core of the cable. This has been a frequent source of trouble in cable laying. From this disadvantage the hemp sheathed cable is manifestly free. The liability to kink and foul is also greatly diminished by using a hemp cable. Inasmuch, also, as a light cable can be stowed away in ordinary sized ships, whose way can be easily checked when an accidental hitch occurs in the paying out machinery, another advantage is found by their adoption.

The electrical considerations put forward by the Light Cable Company do not in any way affect the question under consideration, except, perhaps, in so far as the improved instruments allow a comparatively small core to be used without any diminution in the speed of working. This consideration, however, is obviously as applicable to heavy cables as to light.

In conclusion, we may state that the relative values of the two types of cable can only be satisfactorily ascertained when the result of a light cable expedition is known. Should the result prove propitious, a great impulse will be given to submarine telegraphy, in consequence of the small cost of the new type as compared with the old. It is, however, doubtful whether, even should such an enterprise prove successful, the system could be adopted in tropical regions, where the destructiveness of marine insects is so great, and where various causes of mechanical injury exist in greater number than in higher latitudes.

The Practical Applications of Electricity.

Professor E. C. PICKERING has recently delivered a very interesting course of lectures at the Lowell Institute upon "The Practical Application of Electricity."

In his introduction to the subject he remarked that many guesses have been made as to the nature of electricity, and many theories advanced that will not bear the test of experiments, and that directly contradict many of the known facts. Attempts have been made to combine the wave theory of light and electricity by supposing that the vibrations of the ether which produce the phenomena of electricity are longitudinal, resembling those of sound, while the phenomena of light are produced by transverse vibrations of the same medium. Another theory, which has long been believed, is that electricity consists of two fluids, and that a body is electrified positively or negatively according as one or the other of these is in excess. According to Dr. Franklin's theory there is a single fluid, and the phenomena depend upon the excess or deficiency of this fluid.

About three years ago Professor Edlund read a paper before the Swedish Academy, in which he advanced the theory that this single fluid was the ether by whose vibrations light is produced—a body being charged positively when it contains an excess of ether, and negatively when the ether is deficient. He has shown that with a given charge it can be calculated with mathematical precision with how much force a body similarly electrified will be repelled, or with what force one dissimilarly electrified will be attracted. The lecturer advanced this last theory only provisionally, as the one that seems to answer all the requirements of the case better than any other.

There are three methods of causing the ether to pass from one body to another. The first is *friction*, as in rubbing glass with a cloth; and this is utilized in the common frictional electric machine. The second is *chemical action*, as in the galvanic battery. In the case of copper and zinc placed in an acid liquid, the copper acquires an excess of ether while the zinc loses it. On connecting the two there is a constant flow from the copper to the zinc. The third source of electricity is *heat*, as in the thermo-electric battery, in which the junction of two dissimilar metals is heated, causing a current to flow from one metal to the other.

Two parallel currents of electricity attract each other when they both flow in the same direction, but repel when they flow in opposite directions. This was very neatly shown by two wires in the field of the stereopticon, one of them being free to move. When the current was sent through the wires in the same direction they approached each other; on reversing the current in one, they were repelled. The vibration of a helix, one end of which just touched the surface of

some mercury, was shown in the same manner. The current being sent through the wire the helix contracted, lifting the lower end from the mercury; contact being thus broken the current ceased and the helix fell by its own weight, again making contact, only to be again broken.

There are four cases of induced currents: (1) Currents producing induced currents; (2) Magnets producing currents (magneto-electricity); (3) Currents producing magnets (electro-magnetism); (4) Magnets producing magnets.

If a wire through which a current is passing be suddenly brought near another wire, a current is induced in the other wire in the opposite direction; and the same thing happens if the wire through which the current is flowing is suddenly removed; but the current in the second case flows in the same direction as in the primary wire. The same effect is produced by suddenly making or breaking the current in the wire. These induced currents are much more intense than the original currents. Advantage is taken of them in the construction of the Ruhmkorff coil, in which a current that will hardly give a visible spark induces, on being interrupted, a current in a second coil which gives sparks several inches in length.

The second case was shown by introducing a magnet into a coil of wire. This produced a current that deflected the needle of the galvanometer. But this is only another instance of the first case, as in the magnet there are currents of electricity continually flowing around the bar. In the south end of the bar these flow in the same direction as the hands of a watch, and in the north end in the reverse direction. This was illustrated by making a current flow through a horizontal helix supported so that it could turn freely; it then acted in the same manner as a magnet. It was further illustrated by two bar magnets hung so that their like ends faced each other; on swinging one it communicated its motion to the other without actual contact. This shows that unlike currents, or currents flowing in opposite directions, repel each other. In ordinary iron bars the currents flow in all directions, and therefore neutralize each other; but, by surrounding the bar with a coil of wire, we can make all these currents move in the same direction, and thus produce magnets; and these magnets are far stronger than any other kind. We can cause this magnetism to cease instantly by breaking the circuit. Upon this property of iron are founded some of the most important applications of electricity.

One of these is the transmission of time from one place to another. A small dial on the table was shown, that had been ticking at intervals of two seconds all the evening. This dial was connected with the clock in the Observatory at Cambridge. Clocks were also shown upon the wall, the hands of which moved once a minute by the same means. The use of the chronograph was also explained. This is a clock which carries a large cylinder upon which is wound a band of paper. A pen is arranged so that it traces a continuous line upon this paper, in the form of the thread of a screw; but every second this pen is pulled a little to one side by an electro-magnet connected with the observatory clock, and thus keeps a perfect record of the time. But this electro-magnet is also connected with a key near the observer, by depressing which he can also draw the pen to one side. At the instant he sees a star cross the spider-line in his telescope he presses the key, the pen is drawn aside, and thus the observation is recorded. He has only to note the time within a minute, and then on examining the paper the exact second is found, and from this determinations of longitude or of time can be made.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

A Solution of "Ohm Catcher's" Problem.

HENPECK, March 23.

TO THE EDITOR OF THE TELEGRAPHER.

In your issue of December 6th, '73, "Ohm Catcher" gives a problem which as yet I have seen no answer to. Is it possible that among the many electricians who read THE TELEGRAPHER not one can be found able to solve this every day problem? Henpeck is a lonesome little village, out of sight of telegraphs and railroads. Such a thing as a galvanometer was never heard of here until recently, when a city telegrapher from a distant place happened to lose a pocket book, marked "Haskins' Galvanometer," as he was passing our school house, *en route* for squirrels and snipe. Since that time the scholars have gone through Haskins so often that any of us work problems like the above either mentally or chalked upon one side of the coal house. Now, "Ohm Catcher," stand from under

and see how it's did. From New York to Harlem the insulation test was 12,620 ohms. This, multiplied by the distance, 8 miles, equals 100,960 ohms, the mileage insulation between the above two points. From New York to New Haven insulation test = 6,805 ohms; this multiplied by the distance, 82 miles, = 558,010 ohms mileage insulation from New York to New Haven. We have just seen that the first 8 miles measured only 100,960 ohms per mile; we therefore have 457,050 ohms per mile on the 8 miles (in the second test of 82 miles) that clearly belongs to the 74 miles between Harlem and New Haven. $\frac{457050}{8} = 57131$, the

amount of resistance which should be added to the 74 miles. This 74 miles in second test averaged (when connected to the 8 miles) 558,010 per mile; dividing by 74 to get the resistance for that portion of line we have 7540. Adding to this the 57131 ohms, = 64671 ohms, multiply by 74 and we are supposed to have the mileage resistance between Harlem and New Haven, $64671 \times 74 = 4,785,654$. It is safe to say that "Ohm Catcher" is not employed upon Western Union lines, as they can't show 74 miles of line in Eastern Division that will average 4,785,654 ohms per mile on a wet day. It is probable, however, that they built the line from New York to Harlem. Now, if this solution is all wrong, charge it to Mr. Haskins and not to

PED. SQUINTFIZLER.

The Canadian Telegraphs and Telegraphers.

OTTAWA, CANADA, March 23.

TO THE EDITOR OF THE TELEGRAPHER.

BEING a constant reader of THE TELEGRAPHER, I am somewhat surprised that a paper like it, having the interest of the fraternity so much at heart, has not more Canadian correspondence, items, etc. I am sure our Dominion ought at least to be able now and again to furnish an item worth the perusal of your readers. I notice that Washington, D. C., sends you the largest amount of correspondence; I suppose it being the capital has a great deal to do with that. As this city also is the capital of this Dominion, perhaps a word now and again would not be thrown away. Business here, and in Canada generally, is pretty dull, but we are on the eve of our harvest now, for the Dominion Parliament meet on the 26th inst. We are not troubled during the session here with Government telegraph bills, or the novel idea of Government telegraphy. Our people have enough on their hands without trying that game; besides, they see that the telegraph facilities provided by the two private companies are quite sufficient for the wants of the people—especially the Montreal Company, whom the press and the public give due praise to, as always pushing the lines into the most remote hamlets and villages. As proof thereof in several places the agents of the company are The Hudson Bay Company Fur Traders—the places being so very remote as to be unable to furnish other agents. In the far backwoods the lines of the Montreal Company extend to the lumber shanties, and several of the offices are located in the shanties; and during the ensuing summer it is thought there is to be extra vigor shown in extending the lines.

Operators are plenty here as elsewhere, and a great many, after arriving at a certain point in the business, throw up the sponge and go in for more reliable employment. Our Canadian operators have a deuced knack of knocking under and marrying rich lumber merchants' daughters. In a drive round the Ottawa valley you can have pointed out to you several responsible looking mansions, and are told such a person lives there. He was a telegraph operator until he married such a one's daughter, and now he's in the lumber business with papa.

We also have our commercial college telegraph nuisance, but it don't make much headway. There is scarce one in the employment of either company but has had to start at the foot of the ladder with a book in his hand as messenger. We don't believe in college diplomas—at least, the heads of the business don't; but, still, something should be done to protect the business from overcrowding, in justice both to the employes at present in the business, and to prevent the public from laboring under the idea that situations are vacant by the hundred, and "fat things" in the business waiting the picking up. I will not trouble you much further, but if you think this worth insertion, I may adopt the old maxim and "try again." FATHER JACK WELSH.

The Urgent Necessity for a Telegraphic Organization.—By Whom and How shall it be Established?

PHILADELPHIA, March 30.

TO THE EDITOR OF THE TELEGRAPHER.

THERE already seems to have been said on the subject, and with reference to a telegrapher's association, quite a good deal.

As regards its being essential to the welfare of the

fraternity, there certainly remains no question of doubt with any of us.

To say a single word more of the necessity of such an organization would seem like a waste of time and material.

What is most needed now is firm, prompt and decided action. Let us not demur any longer upon the subject, but proceed at once to take such steps as will accomplish this desired result. Delays are dangerous.

I am waiting, I fear, rather impatiently for some one to make the start. I trust, however, that it will not be long, for I believe the little spark has already been fanned into a living, burning coal.

Perhaps some one may say "Oh, yes, it is all well enough for you, Mr. Crotzer, to take a back seat and halloo 'sic 'em,' and all that sort of thing. But why don't you make the start? Is it any more obligatory upon us to do so than it is upon you?" This might seem like a perplexing question, and indeed it would be were there no extenuating circumstances on my part. But stop, gentle reader. You know that it never was intended by Holy Writ for any one to attempt exercising talents they do not possess. Perhaps no one among us is more willing to do what they can than your humble servant; but the deprivation (I am very sorry to say) of an early school room, such as many of you have enjoyed, and the benefit of a proper education has rendered me utterly unfit for even a suggestion with reference to a basis for this organization. The spirit is indeed willing, but the flesh is weak. I appeal to you, and those of you, my brothers, who are possessed of the five and ten talents, to make the start; and when the good work has once commenced, I will join you in the exercise of my one talent, and you will find that I shall ever be ready and willing to do whatever is in my power for the furthering of the glorious cause.

We have all been eye witnesses of the many evils which have sprung up from want of such an organization, and many, yea, very many of us have felt the oppressive hand of petty officials binding us, as it were, like so many slaves, and compelling us to accede to their tyrannical and unjust demands. What has been our condition, and what is our true condition to-day? Why, we stand utterly powerless to defend ourselves.

Now, here comes the question: have these evils ceased to exist, and the fetters which have so long bound us down been removed? If so, then we are free, and no organization for protection is needed.

But, ah! how vividly and strikingly does this question come to us all! The very thought of our condition pierces our hearts with a thrill that almost makes our blood run cold. Those who have not experienced the evil can form but little conception of its hateful-ness and true nature; and they, of course, are not sympathizers with us.

This leads me to remark, in conclusion, that we must not depend on outsiders to make the start. If we do we shall always remain just where we are. There is work, and ardent work, to do, and it involves upon us to do it.

Let us go forth with strong hands and willing hearts, and we shall accomplish a work which will cause our names to shine forth as bright as any upon earth. The longer this matter is delayed, the more difficult will it be to accomplish; so we can see at a glance the great necessity of immediate action.

It needs not that we should search deep down into the hidden mysteries of some ancient organization for a form upon which to establish or found our organization. All we need is a plain, simple form, yet binding and impressive.

Now, do let us realize our awful condition, and take such steps as are necessary to eradicate the existing evils. It may prove an arduous task; but we must plant and suffer if we would reap and rejoice.

CROTZER.

Suggestions for a Telegraphic Organization.

TO THE EDITOR OF THE TELEGRAPHER.

FOR some months past correspondents through THE TELEGRAPHER have been agitating the question of a Telegraphers' League. They seem to have no definite idea about the matter—at least, they do not express any, as far as I have seen—and all the while we are losing most valuable time. Some one should bring the subject forward in a tangible shape. It may be that a great many of those writing merely wish to see something of their own production in print, and do not care whether we have a League or not. When the subject was broached by me to a brother operator to-day, he said: "Well, I don't know; I had such a sad experience with the old League that I am almost afraid to join another one. Still, if there were one gotten up on a good sound basis, and having the welfare of the fraternity at heart, I would join it." There, that hits the nail squarely upon the head, and I believe the great majority of operators throughout the country hold the same views to-day; yet, I am aware that some would oppose it from fear that there would hereafter be a strike. It by no means follows that, if we have a League a strike should necessarily be the result. Telegraphers, as a class, are not

fools, and there is no reason why we should not have a League that all would be proud of—employers as well as employés. Now, let us brace up and start this thing somehow, and we can soon have a League that all telegraphers will be glad to become members of—not only operators, but linemen, and everybody that ever "cleaned a zinc," or "shinned" a pole.

If I may be allowed a little more space let me advance a few ideas as to what our objects should be in organizing a League. Let us organize something after the style of the B. O. L. E., having for our watchwords, Charity and Benevolence. In case of sickness let each circuit, "whenever necessary," provide and care for the member so afflicted, and in case of death levy a small tax upon each member—say 50 cents. The amount so collected would go far toward relieving the wants of the family of the deceased; assist unemployed members to obtain situations, and, if necessary, support such members while out of employment—"provided, however," that they are not thrown out for any wrong action of their own—use every honorable means in our power to adjust difficulties that may arise between employés and employers, labor assiduously for the development of a plan of action that may be beneficial to both parties, and cultivate that friendly intercourse which is so conducive to the prompt and satisfactory transaction of all business entrusted to our care. Discourage "plug" factories, and events will soon place many of these anxious aspirants for telegraphic honors where nature and their abilities naturally intended them—i. e., "hoeing corn." Organize such a League that operators will be anxious to become members, and not be in continual dread of seeing that skeleton "strike" behind the door. Provide for annual conventions and the attendance of one or more delegates from each circuit, with power to decide all questions affecting the interests of the League throughout the country. Have no one man power; start it on a good sound basis, and we shall have clear sailing right along.

Now, who are the ones to begin the work? We certainly should have as much "spunk" as the "errand-boys," and not be backward in this matter. Start the ball and there will be plenty of earnest workers to keep it in motion. More anon "SIERRA."

Plan for a Telegraphic Union.

TO THE EDITOR OF THE TELEGRAPHER.

IN THE TELEGRAPHER of March 21st I notice a communication on a Telegraphers' Union. I would say that the only way in which we can establish such an organization is for every operator to work for it; take it in divisions, call a meeting of the operators of the surrounding places, and form a local organization. This will induce others to engage in the work, and, by so doing, in a short time all will be combined together. Railroad Telegraph operators should call a meeting on their respective divisions, and let each do this until a combination of all is effected. By doing this we can help each other along. One thing should be understood at the start, and that is that the organization is not intended to encourage strikes, for nothing substantial can be accomplished by such means. The Western Union employés tried that experiment to their cost, and I have known many first class operators who were engaged in it and lost all that they had, and more than that, were, for a time at least, debarred from obtaining employment in consequence.

This is the first time that I have attempted to write an article for THE TELEGRAPHER, and I am induced to do so now in the hope that we may succeed in establishing a Union that shall be a union of telegraphers now and forever. Let us, one and all, act together, and do all in our power to organize such a Union. Let us not put it off from day to day, but go to work as if we were in earnest. F.

Experience of a Telegraph College Student.

CINCINNATI, March 26.

TO THE EDITOR OF THE TELEGRAPHER.

IN last week's issue of your paper I noticed a communication entitled "The Telegraph College Humbug," in which is mentioned the experience of a student just returned from college with a full fledged diploma, etc.

If not occupying too much time and space, let me state my experience. Although only a student at the present time, I bid fair to become an operator one of these days.

Last July I came to the conclusion to become one of those fellows that handle lightning so deftly.

I made application to one of these "College Humbugs" (which Mr. Wilkes so properly named), and made inquiries as to the length of time it would take to become competent of taking charge of an office.

His answer was, "about four months." So I plunked down my \$40, and went to studying like a good fellow.

About a month after, I had a little conversation with the President of the College, and he said, Mr. — (teacher of telegraphing), tells me you are the most

apt scholar in school; so if you keep on as you have for the last month we'll have you in the "Western Union office" in another two months or so, commanding a salary of \$70 or \$80 per month. I kept on studying, of course, highly elated with such fine prospects ahead.

Well, things went on thrivingly until, at the end of fourteen weeks, I could receive (as I thought) thirty words per minute, and the teacher hinted several different times that it was about time I was going.

So, through the influence of my father, one day I got permission to study in some regular office to learn the calls and business of the line. Judge my surprise when I arrived at the office to find that every dot and dash was like so many raps with a hammer. Occasionally I could get a letter of the calls (I couldn't have received them if they hadn't been repeated so often).

But, nothing daunted, I settled right down to commence over again, and here I expect to remain until I become what I intended to be—an operator.

A STUDENT.

P. S.—Should this meet the eye of any young man intending to learn the art, take the advice of one that has "been through the mill," and study elsewhere.

A Problem for Mr. C. H. Haskins.

CHILLICOTHE, O., March 26.

TO THE EDITOR OF THE TELEGRAPHER.

IN Mr. Haskins' work, "The Galvanometer and its Uses," page 37, he gives a rule for finding the mileage insulation resistance of different sections of a line when tested from a single station. Will Mr. Haskins be kind enough to solve the following problem by his rule:—From "A" to "B" 93 miles, glass insulation, the resistance, when tested from "A," with "B" open, was 14,140 ohms; with "C" open, six miles farther, resistance was 10,740 ohms. This six miles is insulated with Pond insulators. I am unable to work out a satisfactory result according to Mr. Haskins' rule. Perhaps I do not exactly understand the rule.

I. N. M.

Telegraphers' Association.

TO THE EDITOR OF THE TELEGRAPHER.

IN nearly every number of THE TELEGRAPHER of late we see something in reference to a telegraphic association, either protective or otherwise. "Common Sense," after minutely detailing our necessities, says, "It is useless for telegraphers to write communications to THE TELEGRAPHER on the necessity and desirability of an organization of the telegraphers, and then let the matter drop," and "The only way to effect an organization is to start it," etc.

If "Common Sense" is now a Western Union employé, and wishes to sever his connection with the company to engage in something more lucrative, and don't know just how to go to work to do it, we would suggest that he start it at once. If after starting it, he can feel a head on his shoulders every day for a month, he will have made himself famous among his fellow craftsmen forever. If he has a wife and children dependent upon his telegraph salary for support, and has no other means of getting a living, we would advise great caution. However desirable an organization may be, if the craft lacks backbone and nerve it is simply impossible. A large number of operators are now under bond (the more shame to them) not to again associate themselves with an organization while in the employ of the Western Union Company. Those who are not so bound dare not initiate the movement, because the supply of "bread and butter" is thereby greatly endangered.

"Scott" asks: "Why is it no one is bold enough to come out openly and declare a union which we must and will have?" My friend, ask your own heart that question, if you are a Western Union man. Why do you come to us under an assumed title asking a question in a communication, which of itself is evidence of your lack of backbone?

When we see a call for a convention of operators, signed by enough of the first class men of the country to half fill the columns of THE TELEGRAPHER, then we will have some confidence and sympathy with the movement. BACKBONE.

Don't Want Him.

TO THE EDITOR OF THE TELEGRAPHER.

ENGLAND declines, with thanks, the questionable honor of being (as stated in your issue of week before last), the birthplace of the defaulter, McCallum. Ireland is the unfortunate country he lays claim to—he hailing from near Dublin. JOHN BULL.

The Eastern Telegraph Company's traffic receipts for the month of February amounted to £31,084 against £30,284 in the corresponding period of 1873.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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The Correspondence of The Telegrapher.

THE portion of THE TELEGRAPHER devoted to the publication of the communications of correspondents is, perhaps, the most interesting department of the paper. It comprises an average of three or four columns per week, and an attentive perusal of it will afford a very good indication of what, for the time being, most interests the fraternity. As it is the rule to permit the freest discussion and presentment of the ideas and views of the fraternity, it not unfrequently happens that there is found in the same issue the most opposite and dissimilar contributions. Our constituency is a very large one, and naturally not always of one mind upon any subject. Just now the subjects which appear to interest the largest number of correspondents are those of a telegraphers' organization, and a very determined opposition to telegraph schools and colleges. The present number contains several communications upon these subjects, which will be found well worthy of perusal.

The discussion of a telegraphers' organization seems to break out periodically; and, judging from the number of communications on the subject which have appeared of late, the fraternity might be supposed to be at fever heat in regard to it, and ready to proceed at once to the inauguration of a movement which shall concentrate the efforts of the thousands of telegraphers towards improving their condition. And yet it is not improbable that it will gradually subside without even an attempt being made to effect any real organization. The reason for this is obvious. It is much easier to discuss and advocate than to actually accomplish any desired or desirable movement or reform. It is human nature to look to somebody else to accomplish a task which involves a considerable labor, and which may, perhaps, prove damaging to those who shall proceed openly and effectively to do what so many are talking about. Many of our correspondents have very indefinite ideas as to what shape such an organization should take, or what is to be accomplished by it, or how it is to be effected. Some seem to suppose that merely establishing an organization will at once bring about a telegraphic millennium, in which all telegraphers shall receive the highest amount of compensation for the minimum of labor and responsibility. On one point most of them are careful to be explicit, and that is, in disavowing any desire or intention of favoring another strike. The lesson received on that head is too recent

and was too severe to admit of its being considered as one of the means by which the welfare of the fraternity is to be advanced.

It is undoubtedly desirable that a telegraphic organization should be effected; but that it would at once realize the sanguine anticipations of some of the more ardent of its advocates may well be questioned. It may as well be understood at the outset that such an organization cannot spring up at once full grown. It must be effected, if at all, gradually, and through persistent and hard labor on the part of those who may institute it. Unless more carefully and thoroughly elaborated than either of those which have preceded it, it cannot succeed in becoming either important or powerful. It must have a carefully considered basis of principles and purposes, and the means by which the latter are to be accomplished must also be decided upon in advance. It is well that strikes should be ignored at the outset. They are illogical, and generally eventuate in more injury to the strikers than anybody else, though they are exceedingly damaging to all parties concerned. But our purpose was rather to offer some general suggestions in regard to our correspondence than at this time to ventilate our own opinions otherwise than incidentally upon the subjects discussed.

Telegraph schools, institutes or colleges, naturally come in for a good deal of indignation and denunciation on the part of our correspondents, and very justly so. They are generally arrant swindles and humbugs, but we do not believe that they actually add any considerable number to the operating force. It is, perhaps, unfortunate that those who are induced or inveigled into wasting their time and money upon these affairs so seldom see or read THE TELEGRAPHER, otherwise they might save both.

Scientific and practical telegraphic ideas and subjects are also very frequently and forcibly discussed by correspondents of THE TELEGRAPHER, and much valuable instruction and information is thus imparted in a popular and effective manner.

There is not, we are pleased to note of late, so much disposition shown to personalities in our correspondence. This comes, in some degree, from a better comprehension of the relative duties of the employés occupying positions as officials and subordinates, and in part, perhaps, from better treatment of the telegraphers, as a whole, by their superiors. No doubt there are yet many instances of oppression, but except in extreme cases, it is, perhaps, better to forbear than to rush into print with denunciatory communications.

It is somewhat curious to note how subjects which have at times excited the greatest interest cease to be the occasion of even occasional mention by our correspondents. A few years since, for instance, the columns of THE TELEGRAPHER were flooded with communications on the female operator question. So hotly did the contest rage, in fact, that we were obliged to close it, so far as the paper was concerned, for some time. When we did so in self-defence, and because about all had been said on the subject, pro and con, that could be said, and the communications were mainly repetitions of the same ideas by different persons, we had on hand letters enough on the subject to fill a double number of THE TELEGRAPHER. Since that time women have come to be accepted as a part of the telegraphic force, and the dire evils and exclusion of the masculines from the telegraph service, which some of our then correspondents predicted and anticipated, not having been realized. We have received no communications on the subject for two or three years past, although the embargo has been raised. The question does not now possess sufficient interest to induce any one to shed ink or waste telegraph blanks in its discussion.

We do not propose to follow the consideration of the correspondence of THE TELEGRAPHER out in detail. We have no doubt but that the communications are read with much interest, and that the value of the paper as a medium for expressing the views, sentiments and wishes of the members of the fraternity, is duly appreciated. We are pleased to be able to afford the tele-

graphers such a medium, and welcome to our columns their contributions. We will give all a chance to be heard—provided their communications are not libellous or objectionable, are written on one side of the paper, and are accompanied by the names of the writers, not for publication, but as an evidence of good faith on their part. Anonymous communications are not desired, and as some have doubtless learned from the non-appearance of their letters, receive very little attention or consideration at our hands.

Railroad Telegraphs.

A RAILROAD without ample telegraph facilities is inefficiently equipped for service. This fact is generally recognized everywhere on the American continent except in New England, which, notwithstanding the enterprise and intelligence that usually characterize New Englanders, is far behind the rest of the country in this respect. With one or two exceptions, New England railroads are, without any telegraph system especially adapted to their service. This may be economy, but to the rest of the country it seems rather like parsimony, and a very unprofitable parsimony at that.

The railroad telegraphs have within the last few years assumed an extent and importance which constitute them a very important branch of the telegraph service. The capacity of a railroad is so largely increased, and the safety and reliability of the movement of trains so greatly augmented by adequate telegraph facilities, that it appears most singular that the managers of any road should allow their road to be without them.

There are thousands of telegraphers specially employed in the railroad telegraph service, and the standard of telegraphic ability and character of railroad telegraph employés has been much improved within the past two or three years. There is still room for material improvement in this respect, and it would be greatly facilitated by a more adequate remuneration for such services. The position of a railroad telegraph operator is one of the most laborious and important in the whole range of telegraph service, and should be remunerated accordingly. Upon his faithfulness, ability and reliability, constantly depend not only the safety of most valuable property, but the lives of thousands of passengers and railroad employés.

We long since recognized the importance and extent of the railroad telegraph service, and THE TELEGRAPHER has given to it that consideration which it so eminently deserves. This is the only telegraphic publication in the world that has accorded to this important branch of telegraphic service such recognition, and this fact has been appreciated to a considerable extent by the railroad telegraph operators and employés generally, who very justly look upon THE TELEGRAPHER as their organ and representative.

We shall at all times endeavor to secure justice and proper compensation to this hard working class of telegraph employés, and shall continue to urge an improvement in the standard of telegraphic talent employed on railroad lines.

So important do we regard it that all railroads should be operated by means of the telegraph, that where railroad managers do not voluntarily establish and maintain telegraph lines especially devoted to their roads, we think that they should be compelled to do so by law.

President Orton Gone Abroad.

MR. WM. ORTON, President of the Western Union Telegraph Company, sailed for Europe on Saturday last on the steamship Republic. Mr. ORTON has been very ill for the past two or three weeks, and goes abroad now for relief and relaxation from the exhaustive duties of his onerous and laborious position as the Executive of the Western Union Company. We hope that he will experience the benefit desired from this respite, and will return with renewed health and strength.

Reports were industriously circulated last week that

his visit to Europe was in connection with proposed important telegraphic arrangements; but this, we are assured, is incorrect. The speculation in Western Union shares is so active, and the fluctuations in the quotations so great, that the movements of every person prominently connected with the company are closely watched, and are made the occasion for the circulation of all kinds of reports calculated to influence the price favorably or otherwise.

Tillotson & Co. on Hand.

OUR friend TILLOTSON is evidently determined not to be outdone in any department of the telegraph instrument and supply business. The numerous advertisements of his firm which may be found on nearly every advertising page of THE TELEGRAPHER, sets forth the inducements to patronize the firm. They have won a very high position in business by the fair and liberal dealings for which they are noted, and which is eminently characteristic of the firm.

They carry the largest stock of any dealers in the country, and are ready to fill promptly any orders sent them, however large or small they may be. It is almost impossible to call for anything required for telegraphic purposes that cannot be found in their extensive establishment.

The Advertising Patronage of The Telegrapher.

OUR advertising patrons are literally overwhelming us with their favors. We are obliged to encroach somewhat on our reading space this week to accommodate those who desire to avail themselves of the advertising facilities afforded by THE TELEGRAPHER. If the pressure on our columns continues we shall be compelled to again enlarge the paper at no distant day.

With an increasing circulation, and so liberal an advertising patronage, the future of the paper certainly appears, to say the least, encouraging.

The Snapper Sounder.

THE Snapper Sounder, the invention of Mr. RALPH W. POPE, of the Gold and Stock Telegraph Company, 61 Broadway, is one of the greatest successes of the season. They are all the rage, and may be heard in all public places where telegraphers are found. Those telegraphers who have not already purchased them are being rapidly supplied.

The Pennsylvania Telegraphic Agency.

AN advertisement of this new telegraphic agency will be found in our advertising columns. A new railroad telegraph sounder is a specialty with this concern, which is now offered to the public, with battery, chemicals, etc., all complete.

Mr. GEORGE L. SPARKS, a practical telegrapher, is the manager of this enterprise, and we would bespeak for it a share of patronage.

Personals.

Mr. CHAS. C. WHITNEY, for many years connected with the Indianapolis, Ind., W. U. office, has resigned his position as chief clerk to Supt. WALLICK, to accept that of assistant secretary to the Franklin Life Insurance Company of that city.

Mr. GEORGE P. LENNOX, late of St. Louis, Mo., is on his road to San Francisco, Cal., where he was for a long time operator in Gov. Stafford's office, and occupied a good position as an operator.

The Telegraph.

Additions to the Atlantic and Pacific Telegraph Lines.

THE Atlantic and Pacific Telegraph Company have recently purchased the Scioto Valley line, which extends from Columbus to Portsmouth, Ohio, and will put it in good working condition immediately.

They have also taken on a perpetual lease the Marine and Inland line, from New York to Long Branch, N. J., which gives a connection at New Brunswick, Red Bank, Keyport and other places in New Jersey. The

additional telegraphic facilities afforded at Long Branch will be of great value and importance during the coming season.

The Contract for the Panama and Payta Cable.

THE Panama correspondent of the *New York Herald*, writes, under date of March 22d, in regard to the contract for the submarine telegraph cable between Panama and Payta, that the Peruvian Government has just entered into a contract with Mr. Donald Cruikshank, the agent of the Telegraph Maintenance Company, of London, to lay a cable between Panama and Payta, the Peruvian Government pledging itself to get the consent of the United States of Colombia, and a similar privilege for the enterprise to that to be enjoyed while running through Peruvian territory. After the contract had been signed it was discovered that, some weeks before, the Foreign Office in Peru had been informed that Colombia conceded the privilege desired, on condition that the cable should not only connect Panama and Payta, but should go out of its straight course and touch in at Buenaventura, another port in Colombia. Mr. Cruikshank would have nothing more to do with the affair, and is here on his way home to report to his company.

Foreign Telegraphic Notes.

THE Great Northern (Chinese) Telegraph Company has recently established a line between Woosung and Shanghai. Twenty words are sent for a dollar. This is the first attempt to introduce the telegraph through the main portion of the empire, as previous efforts have been met with violent opposition from the people, who cut the wires and destroyed the poles.

The Brazilian Submarine Telegraph Cable Expedition left Madeira on the 28th ultimo, for St. Vincent, Cape Verd, and it is presumed the cable will by this time have been successfully laid. Any messages addressed to Charles R. Blandy, of Madeira, by the African or other steamers leaving England, will be at once sent forward to St. Vincent, whence they will go on by steamer to South America.

The accounts of the Direct Spanish Telegraph Co., made up to December 31, 1873, show a balance to the credit of profit and loss of only £12, 15s. 8d. The causes which have prevented a more satisfactory result for the past year are the breaking of the cable, and the manufacturers, who had to restore it at their own cost, being unable, owing to an accident to their steamer, to complete the repairs until the 28th April, when business was at once resumed, the interruptions caused by the Carlist insurrection, and the working of the cable having been entirely stopped in consequence of the close investment and siege of the town of Bilbao by the Carlists. Out of the 306 days between the 1st March and the 31st December, 1873, the cable, for the reasons above stated, was only at work 113 days. Having in view the possibility of Bilbao remaining blockaded for an indefinite period, the directors have applied for and recently obtained from the Spanish Government a concession for the temporary removal of the Spanish end of the cable from Bilbao to Santander (a town not likely to be affected by the Carlist insurrection, and having uninterrupted communication with the interior of Spain), and have made arrangements to carry out the necessary works at once.

The report of the Directors of the Mediterranean Extension Telegraph Company to the shareholders stated that the traffic for the entire year was slightly in excess of that for 1872, and it would be seen that the amount claimed under the guarantee was not so large as for the preceding half year. The cables and land lines were all in good working order, and the cost of maintenance had been small. The Directors proposed to recommend payment of the usual half yearly dividend on the 8 per cent. preference shares of the company, and of a dividend at the rate of 3 per cent. per annum on the ordinary share capital, payable on and after the 16th inst., leaving £491 to be carried to the reserve, which would then amount to £6,256.

In answer to a question of a shareholder at the half yearly meeting the chairman stated that the negotiation with the Eastern Telegraph Company for a consolidation had fallen through, and the proposal had been withdrawn. The dividends recommended were declared.

The receipts of the Eastern Extension, Australian and China Telegraph Company, for the month of February, amounted to £17,706 against £18,085 in the corresponding period of 1873, from the four separate lines, viz: The British Indian Extension, China, Submarine, British Australian, and the Victoria and Tasmanian Telegraph.

The receipts of the Submarine Telegraph Company for the month of February, amounted to £7,800 against £7,616 for the corresponding month of 1873.

Action of Western Union Employees on the death of George H. Everett.

CINCINNATI, O., March 26.

At a meeting of the operators of the Western Union Telegraph Co., held March 26, at their office in this city, the following resolutions were unanimously adopted:

Whereas, God, in his infinite wisdom, has taken from amongst us Geo. H. Everett, our former fellow operator,

Resolved, That in his death we feel the loss of a genial companion and a warm and faithful friend.

Resolved, That his abilities had placed him high in his profession, and that the fraternity have lost an able co-operator.

Resolved, That we deeply sympathize with the family of the deceased in their affliction, and that a copy of these resolutions be sent to them, and also to the newspapers of this city, and the telegraphic journals, for publication.

Break! For the Light is Breaking!

(A LOW COMEDY.)

"Oh! running stream of sparkling joy,
To be a soaring, human boy."—*Dickens.*

ACT I.—*Scene*, Trenton (G). Time, 11 P. M.

"Jf" (M'g'r) busily engaged with reports, suddenly arises to answer a persevering *plume* at Phillipsburg, who has been calling since 10:

"Jf"—I, I, G.

Plume—"Is it Jf?"

"Jf"—"It is."

Plume—"Will you practice with me?"

"Jf"—"Aye."

Plume—"68 send something to me."

"Jf"—"You don't want any practice in 'receiving.' It's 'sending' practice you need. Start off on some press, and don't stop to ascertain if I am getting it. I never break."

Plume shoots off on an editorial in the *New Jersey Agriculturist* (3 columns).

"Jf"—"Let her come, young man."—Cuts out [Exeunt.]

ACT II.—*Scene*, the same. Time, 7 A. M.

"Jf," upon cutting in the Phillipsburg wire, hears something which sounds very much like "an ambitious hen among broken bottles."

"Jf"—"Please sine 'G.'"

Plume—"Pa, pa, I thought I could maj you break." —*The Switch.*

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5509, New York City.

For the week ended February 17, 1874, and bearing that date.

No. 147,487.—**DUPLEX TELEGRAPH.**—George D'Infeville, New York, N. Y., assignor of one fourth his right to William N. Armstrong, same place. Application filed April 25, 1873.

No additional local or split batteries used. Two main batteries opposed, and battery at sending station localized, for preserving equilibrium.

1. The method of duplex telegraphing, substantially as described, by localizing or short circuiting the main battery at the sending station, thereby preserving the magnetic equilibrium in the signaling instrument of that station, and allowing the battery of the receiving station to exert its full force in recording or indicating signals, substantially as herein described.

2. In combination with a normally closed telegraphic line having main batteries, one at each terminal, connected to the line in opposition to each other, open circuit single contact keys M¹ and branch circuits N¹, connected to the relay magnets at a suitable point, the closing of the said keys short circuiting or localizing the battery of the sending station through the proper proportion of the coils of the relay, substantially as set forth.

3. In combination with a relay magnet having its layers exposed for connection to key, and for approximate adjustment, as described, the shunt circuit M and rheostat c, substantially as and for the purposes set forth.

4. In combination with the normally closed line, having the branch circuits h¹ and open circuit single contact keys, and opposed batteries, as described, the battery reversers and closed circuit keys, substantially as set forth.

5. The combination, at an intermediate or way station, with the main line of a duplex telegraph, of the open circuit key P and branch circuit t, connected to the relay between the terminals, the depressing of the key closing independent circuits for both terminal batteries, giving signals to both sides of the way station in single transmission, or forming a duplex line with one terminal, substantially as described.

No. 147,524.—**DUPLEX TELEGRAPH.**—Joseph B. Stearns, Boston, Mass. Case C. Application filed February 21, 1873.

Current divided at a point between the line and relay of sending station, the line current going to distant station and returning through home relay to battery, the equalizing or local current going directly through home relay, the effects being neutralized therein, and, through an additional relay, enabling the sender to read his own writing.

The combination of the differential relay's M, sounder or relay 2, resistance R, key K, battery L B, and their connecting circuits, as and for the purposes set forth.

No. 147,625.—**DUPLEX TELEGRAPH.**—Joseph B. Stearns, Boston, Mass. Case A. Application filed February 21, 1873.

Equalizing current passed through coil around armature of

relay, so as to neutralize inductive effect of relay magnet thereon.

The combination of the magnet R, armature A, and coil C, in the manner and for the purpose substantially as set forth.

No. 5,768.—(Reissue).—GALVANIC BATTERY, AND COMBINING THEREWITH SECONDARY OR ACCUMULATING BATTERIES.—Georges L. Leclanché, Paris, France, assignor to Hilborne L. Roosevelt, New York City.—Patent No. 64,113, dated April 23, 1867.—Division A. Application filed January 27, 1874.

Peroxide of manganese sealed up in porous cup with graphite muriate of ammonia used in solution. Accumulating cells used in connection therewith.

1. The combination, with the other necessary elements of a galvanic battery, of peroxide of manganese, substantially as described, and for the purposes set forth.

2. The combination, in or with the porous cells of a galvanic battery, of an anode and salt or salts to be decomposed, substantially as described, and for the purposes set forth.

3. The combination, with the anode in a porous cell, of the decomposing and to be decomposed salts packed therein in a dry state, substantially as described, and for the purposes set forth.

4. The combination, with the anode in a porous cell, of salts highly insoluble, and salts for decomposing the same by electrolytic action, substantially as described, and for the purposes set forth.

5. The graphite plates, the flask, and the porous vase, all in combination, substantially as described, and for the purpose set forth.

6. A polarizing apparatus in combination with the battery, as hereinbefore described, and for the purposes set forth.

7. The combination, in general, in a galvanic battery, of the ammoniacal salts with the peroxide of manganese, substantially as set forth.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

MARCH.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
26.....	81½ ... 79½	.....	59 ... 59
27.....	82½ ... 80½	.....	59 ... 59
28.....	80% ... 79½	.....	58% ... 58½
30.....	84½ ... 79	58% ... 58½
31.....	80 ... 79	59 ... 59
APRIL.			
1.....	80 ... 79½	163¼ ... 163¼	58½ ... 58½

TILLOTSON'S INSULATORS.

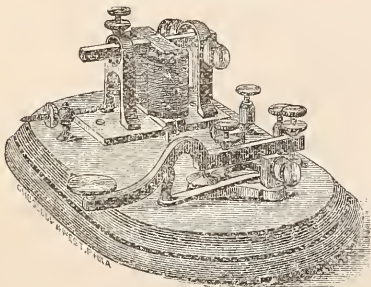
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A LARGE STOCK OF ALL KINDS constantly on hand.
BEST MATERIAL AT LOWEST RATES.

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EVERY KNOWN FORM ALWAYS ON HAND.
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SULPHATE OF ZINC, ETC., ETC.
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THE PENNSYLVANIA TELEGRAPHIC AGENCY,
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Nickel Plated.
FULL SIZE RAILROAD SOUNDER AND KEY.
NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.
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If money be sent in advance by registered letter..... 12 00
Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,
BY
TAL. P. SHAFFNER, LL. D.,
Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Caton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Oersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but not mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given. The publishers will be announced hereafter.

THE "SNAPPER." Price, 30 cents.

How the Boys "tumble" to it!

READ THE FOLLOWING:

St. Louis, March 24.

R. W. POPE.
DEAR SIR—Enclosed please find \$1.20, for which please send four of your "Snapper" Sounders to the following addresses:

- E. A. ALLEN, W. U. Telegraph office,
- H. J. FOREMAN, W. U. Telegraph office,
- W. J. FOY, W. U. Telegraph office,
- Ed. A. KLENE, Jr., W. U. Telegraph office.

Your little Sounder has created quite an excitement among the boys here.

Later.—Still they come. Send one more to the following address: MARC GAUTIER, W. U. Telegraph office. ED.

P. S.—Another County heard from.—Send one more to CHAS. E. BURROWS, W. U. office. The total inclosed for six Sounders, \$1.80.

EDDYVILLE, IOWA, March 21.

DEAR SIR—Please find enclosed 60 cents for two more of your "Snapper" Sounders. If you get this before filling order of the 20th, please enclose the four in paper box. Think will send for couple more in a week. They make more fun for their price than anything I ever saw. Please hurry them along. Can hardly wait.
ED. LEGGETT.
Manager W. U. office.

DETH MILLS, MICH., March 24.

DEAR SIR—Please send me three more of the "Snappers." Best thing out. Boys all like them. Please find enclosed 90 cents. Respectfully,
H. HALL.

Sent, post paid, for 30 cents, or six for \$1.50. Purchasers in the British Provinces will please remit 5c. for additional postage.

R. W. POPE,
Box 5278, New York.

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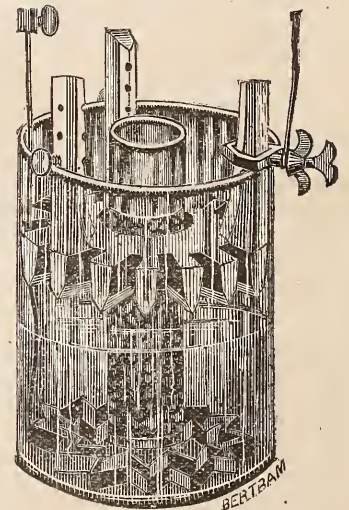
The custom introduced by us of making Agents of managers and operators, and sharing the profits from the sales of these Instruments with them, has also assisted in increasing our sales to such an extent that we have been compelled to enlarge our facilities for their manufacture.

We are now prepared to furnish these unrivalled Amateur Instruments, with or without Office Outfits, in any quantity and at a moment's notice. Our Agents may now send in their orders as rapidly as they please, and can rely upon their being promptly executed. Prices as heretofore.

- Instrument complete, Key and Sounder..... \$6 50
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Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

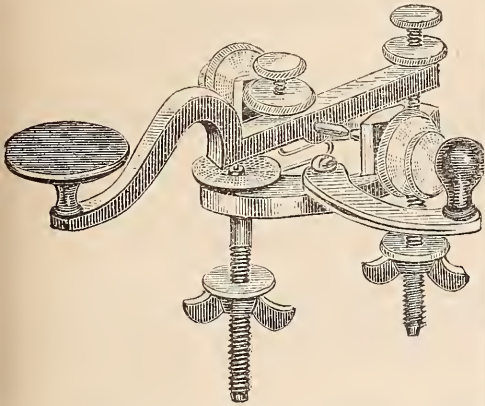
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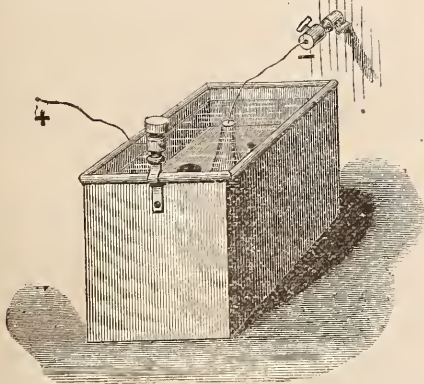
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

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Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

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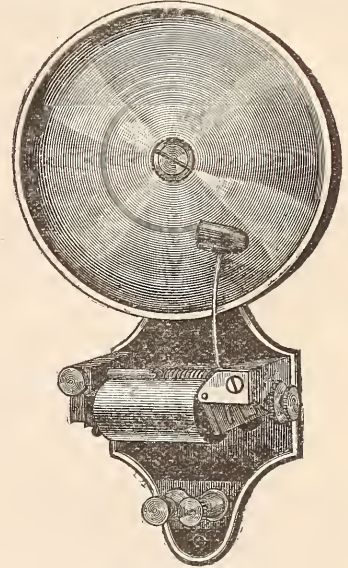
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- A N EXTRA FINISHED AND GOOD WORKING SOUNDER,
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Instruments, Line Material, Office Wire, Magnet Wire, Tools, Battery Material, Chemicals, Books, Stationery, constantly on hand.

Special attention given to REPAIRS and MODEL WORK.

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Between Fulton and John Streets, NEW YORK.



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

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RELIABILITY and

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Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

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WHICH ARE OF
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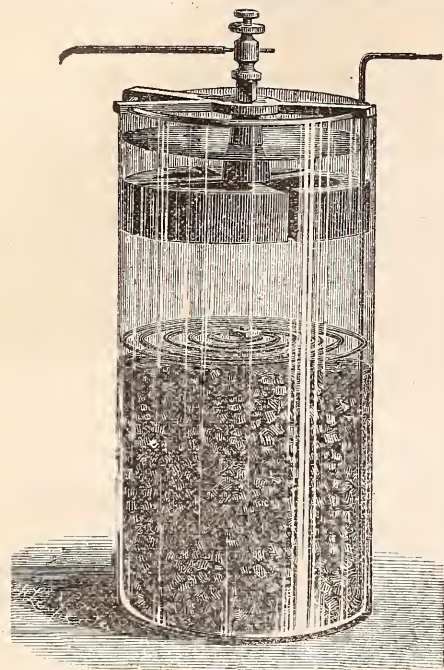
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any attention whatever. The copper and zinc solutions are perfectly separated, and there is

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The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
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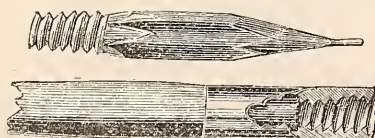
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SOLE AGENTS.

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This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, April 11, 1874. Whole No. 404

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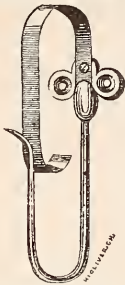
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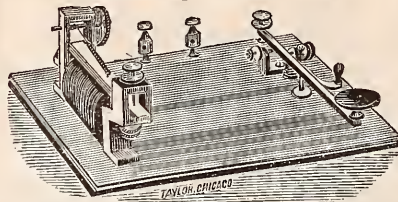
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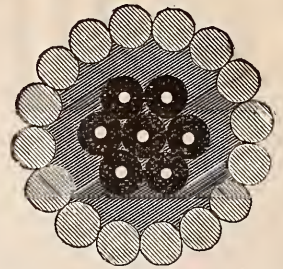
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, - - - - - PUBLISHER.

SATURDAY, APRIL 11, 1874.

VOL. X. WHOLE No. 404.

The Craven.

BY OWTON A. FLYE.

Once upon a mid-week dreary, while we all sat faint and weary,
With our hearts out in the sunlight of the blessed words "no more,"

As we all sat idly gazing, suddenly there came a flapping,
As of some one wildly slapping, slapping at our office door.
"Tis some creditor, we muttered, "slapping at our office door,
As he oft hath done before."

Ah, distinctly I remember, it was in the fresh November,
And each sad, insolvent member cast his eye toward the door.
Vainly had we tried to borrow from a friend until the morrow—
The morrow which we all felt to deplore;
And our hearts went fondly back to the plentiful days of yore—
Gone from us forever more.

And the fierce and lively bustling of the check boys quickly
hustling,
Thrilled us—all filled us with fantastic terrors never felt before;
So that now, to still the beating of our hearts we stood repeating,
"Tis some creditor entreating entrance at our office door;
Some ardent creditor entreating entrance at our office door;
That it is," as we said before.

Presently Griswold's soul grew stronger; hesitating then no
longer,
"Sir," said he, "or Madam, truly your forgiveness we implore;
But the fact is, we were gazing, and so loudly you came flapping,
And so wildly you came slapping, slapping at our office door,
That we almost thought we heard you"—here he opened wide
the door—
What a look his visage wore.

"Come in," we heard him mutter, when, with many a flirt and
flutter,
There stepped a stately crow in, of the saintly days of yore.
Not the least obeisance made he; not a minute stopped or
stayed he,
But with mien of lord or lady, stalked across the dirty floor,
Up on to Reynold's shoulder, just three feet from the floor—
Perched, and sat, and nothing more.

Then this ebullient bird beguiling his sad fancy into smiling,
Such grave and stern decorum of countenance to see:
"Though thy crest be shorn and shaven, thou," he said, "art
sure no raven,
Ghastly, grim and ancient craven wandering from the hemlock
tree—
Tell me what thy lordly name is on the lonely hemlock tree?"
Quoth the crow then, "73,"

"Prophet!" said he, "thing of evil! prophet still, if bird or
devil!
Whether tempter sent, or whether tempest-tossed thee here
to me;
Busy, yet undaunted, in this noisy spot I'm planted,
In this place by horror haunted—tell me truly, 'tis my plea:
Is there—*is there* balm in Gileads? Tell me truly, 'tis my plea!"
Quoth the craven, "73,"

"Be that word our sign of parting, bird or fiend!" he shrieked,
upstarting;
"Get thee back into the tempest and the lonely hemlock tree!
Leave no black plume as a token of that lie thy soul hath
spoken!
Leave my business hour unbroken! Got thee down onto my
knee!
Take thy beak from out my eyebrow; take thy form from off my
knee!"
Vamosed the craven, saying "73."—*The Operator.*

[From *The Ghost*.]

Posie Van Dusen.

I HAVE a remarkable memory for faces, and though it
was ten good years ago that I first saw Posie Van
Dusen, and I had never seen him, and had scarcely
heard of him since, I recognized him instantly when I
saw him again last fall.

I don't know why he is entitled "Posie." There is
nothing about him suggesting the exhalation of flowers.
His nose is the only blossoming feature about him, but
I have no reason to think he derived his fragrant *sobriquet*
from that. It must have been in the summer of
1863 or 1864 that I first saw Posie. It was the occasion
of my first visit to New York. I was a message
boy then, in a New England office, with a very slight
knowledge of dashes and dots, and having rendered a
railroad superintendent a service, he offered me a pass
to New York. My sensations, on debarking in this
wonderful metropolis, were much, I fancy, as were yours,
my reader. I was captivated with everything I saw,
and astounded with the length and breadth of this
swarming island. To me at that time the poet's bitter
denunciation—

"False land of promise, paved with gold
That turns to iron 'neath the blistering foot,
Lured by that rustic lie to pace her streets!
That loadstone rock whereon adventure splits
And wrecks ambition starves."

To me, I say, this had no unusual significance. I saw

only the bright side of the picture, and I tripped gaily
along the route of the telegraph poles, vainly expecting
to reach the office by that means. When I had tired of
this I used my tongue, and ere long I stood before the
great "No. 145," of which I had heard and thought so
much. My cousin was an operator, and in due time I
was ushered into the operating room of the American
company. He was in good standing; he has since risen
to a position of trust; his name is identified now with
the invention of "duplexes" innumerable, and "no
bugs repeaters," and I find him, moreover, despite his
great modesty, a man whose knowledge of electrical
science is generally respected. He introduced me to
the manager, Mr. J. C. Hinchman, to Mr. M. S. Roberts,
general assistant, to Wm. B. Clum, chief operator, and
to Dixon T. Marks, night manager, also to operators
in considerable number; and finally prefacing my
presentation with the remark, "Of course you want to
know all the celebrities," he brought me to where two
young men, apparently cast in the Swivellean mould,
were standing, and said: "This is Tip McClosky, Mr.
Oakum, and this Posie Van Dusen—you have heard of
them both." Indeed I had, and I felt much the same
in their presence as I remember to have felt several
years later, when I stood face to face with Charles
Dickens, and tried to comprehend that this was the
man who had created Cuttle, Copperfield, Agnes, Dame
Durden, and the host whose hopes and experiences
were a part of my own life—the sunniest part of it,
need I add?

The next morning, as I stood waiting for the arrival
of my *chaperone* and relative, who was not due until
8.30, I saw the little army of operators file into the
side door. I was a little shaver, with a round rosy face,
like hundreds of other boys, and I dare say they did
not recognize me. Certainly none of them honoured me
with a bow—not even with the ghost of a wink to be-
token they had ever seen me before. I had not learned
then how slight a claim a boy's introduction to a busy
New Yorker entails. At the end of the list, as invari-
ably happened, came Tip McClosky. His appearance,
even in the distance, was dishevelled, but there was a
devil may-care-air about him as he strutted along,
which was not without its element of smartness. I
turned my face away; I had been snubbed by every-
body, and I would not give this man a chance to wound
my foolish sensibilities. But Tip accosted me with a
kindness in his tones that I have never forgotten. He
shook hands with me and called me his dear boy, and,
leaning up against the little iron railing with as much
nonchalance as if he had been fifteen minutes ahead of
time, instead of fifteen behind, he proceeded to inquire
how old I was, how long I had been learning, and as-
sured me I was doing first rate. "Stick to it, Oaky,"
said he, "it can't be accomplished with a *lep*, it requires
patience and practice. Don't get discouraged, the war
is creating a big demand for operators, and before it is
over I shall expect to hear of you as one the best op-
erators around. And let me give you a little advice, my
boy," he continued, quite seriously, "don't go too much
on your reputation. I have got a big reputation my-
self, and I *must* sustain it. There is no such thing for
me as starting anew, but you can learn wisdom from
my experience. Try to become a good, reliable op-
erator, steer clear of liquor, and you will win. And re-
member, above everything, that it is impossible to do
telegraphic work correctly, without occasional inter-
rogation in doubtful instances, as it would be to print a
book or newspaper correctly before the proof reader had
improved it by his emendations." With this he bade
me "good morning," and, shaking hands again, he dis-
appeared within. I walked on air that morning. All
the encouragement I had ever received was not a tenth
of that which this seemingly abandoned Bohemian had
voluntarily excited. Some one says that every man
has the ashes of a poet in him. I am sure Tip McClosky,
long wandering through this land, and now an exile in
Mexico, has the ashes of a gentleman in him. What a
pity that fortuitous circumstances, home influences, or
an inherent will had not guided the warm instincts of
his soul, and developed them into something worthier;
how sad to contemplate a man wrecked on the waste
waters of dissoluteness, from a mere lack of—something
to change his course.

But I am forgetting Van Dusen. Before I left New
York I learned from Tip that Posie had been dis-
charged. The story was a brief one. Van Dusen,
Tip, and Cap De Costa, another telegraphic knight,
had been up into Westchester County the week before
to a ball. Van Dusen went to play the violin, on
which he performed quite creditably, "though he got
a message going to 14 Milk Street as 1470 K street,"
said Tip, as he related the details. "Posie fiddled,"
said Tip, "as long as he could, and when he had be-
come not only too full for utterance but too full to scrape
the strings, the people piled us into the wagon and
started us home. It was awfully dark, and most of us
were asleep for a long time; but Posie woke up at
length and wanted me to stop the horse; said he
thought his Cremona was knocking around in the bot-
tom of the wagon. So I reined in the steed, and Posie
got out to make an examination. I went right to sleep,

and I guess Cap wasn't awake at all. Anyway we
fetched up at the stable next morning, and Posie
wasn't in. He says now that I drove off and left him
in the woods twelve miles from Harlem. He was five
days footing it into New York, and when he got here
J. C. H. had his paper sealed, signed and ready for
delivery." I wasn't as sorry as I ought to have been.
I didn't like Van Dusen particularly. Perhaps I was
prejudiced by Tip, whom I had once heard tell Posie,
"Yes, you are a big operator—let you tell it."

Last summer I embarked for Boston by the shore
line train, leaving Forty-second street at nine P. M.
There were not many in the cars—a young operator
from Watertown, N. Y., going to New London to work
for the position; a couple of dry goods drummers,
one or two miscellaneous human entities and myself.
Just as the train was starting, a chap whom I at once
recognized as Van Dusen entered the car. He was
redolent of vinous compounds, and before we had fair-
ly steamed into Harlem he had edged himself into the
conversation proceeding between the drummers. One
of them had said something about his "circuit," and
that was sufficient to set Van Dusen's tongue to run-
ning like mad. He worked the first wire that was
ever worked from New Orleans to New York, he
did; he took the first message that was ever sent
across the plains—that's what kind of a man he was.
But his auditors were not so much interested in tele-
graphics as they might have been, and they inconti-
nently snubbed the man of dots and dashes, and he
was obliged at last to address his conversation to the
boy. After a while he got out a railroad flask, and
saying, "The whiskey in that bottle is ten years old,"
he offered some of it to everybody. There were no
takers except himself. He had talked shop just enough
to raise the curiosity of the youngster from Watertown,
and the lad came over and sat with him on the seat
behind me. I couldn't help hearing much of what
was said, and I thanked my stars when I began to feel
drowsy just after leaving New Haven. The train,
however, was a lightning express, and the abrupt
curves and an uneven track swayed the smoking car
like a reed shaken in the wind, and I woke up at in-
tervals of ten or fifteen minutes, I should judge. By some
singular fatality my waking moments seemed to come
just as Van Dusen was beginning to relate the history
of some new adventure. As nearly as I can recall it,
the panorama shifted after this manner:

"Sorry you won't take a drink, young fellow. The
whiskey in the bottle is fourteen years old. I want to
give you a little of my experience; some heavy work I
did in Cincinnati. I took fourteen thousand words of
press—"

Then I fell asleep and woke up to this refrain.

"Sorry you won't take a drink, young fellow. The
whiskey in that bottle is sixteen years old. I want to
give you a little of my experience—some heavy work I
did in New Orleans. I took three hundred and thirty-
one messages in two hours and a half—"

Again, when the car disturbed my nap, I caught:

"Sorry you won't take a drink, young fellow. The
whiskey in that bottle is eighteen years old. I want
to give you a little of my experience—some heavy work
I did in Corinne. Business had been accumulating in
Omaha twelve days, old Jim Lawless was working
there then; fastest sender ever lived. I just told him
to leave out everything and go in. Received from him
seventeen hours and thirty seconds, and took sixteen
hundred messages without a—"

"Why, that is nearly a hundred an hour," ejaculated
the youngster, amazed.

"I don't know anything about that. Wo never
counted 'em to see what time we made," said Posie, in
return, and then I fell asleep again. I couldn't pre-
tend to tell you how many more times I came to the
surface, as it were, and heard the story about that aged
whiskey and the heavy work. The more he talked
about them the older the whiskey got, until its one
hundred and fourteenth year was roached, and I don't
know how many more, and the work became heavier
and heavier as the dust and cobwebs gathered upon
that inspiring flask of spirits. Finally, I fell into a
deep slumber, which lasted until the train went crash-
ing through Hyde Park and Jamaica Plains. I looked
behind me for Van Dusen as we came within sight of
Boston's domes but he was gone, whither I know not.
It was a beautiful morning, and the birds were singing
sweetly in the trees as I staggered across the Common
more asleep than awake. Somehow there seemed to
me to be a story of whiskey and heavy work permeat-
ing the limped tones of the feathered songsters; but
from away over on a hillside, where the branches were
waving in the summer wind of the early morning,
there came the tones of a sweeter singer than all the
rest. Above the din of the many its blithe notes rang
out sharp and clear, and it seemed to sing—possibly I
dreamed all this, but I remember it as a reality—it
seemed to sing those lines of Young's:

"We rise in glory as we sink in pride,
Where boasting ends there dignity begins."

JOHN OAKUM.

The Telegraphers' Mutual Benefit Association.

ASSESSMENTS NOS. 58, 59 AND 60, ISSUED MARCH 24, 1874.

Death of W. H. Kelty, C. P. Rosser and Samuel Porter.

ANNOUNCEMENT is made of the death, during the past month, of three members of the Association. Messrs. Kelty and Porter were among the first members. These frequent deaths may seem to impose a heavy burden on many members, but they also show the need of the Association. Let all be as prompt in their remittances as possible. These deaths necessitate the issuance of another triple assessment.

Assessment No. 58.—W. H. Kelty (certificate No. 261), died Feb. 8th, 1874, at Titusville, Pa. from injuries received by being thrown from a sleigh.

Assessment No. 59.—Charles P. Rosser (certificate No. 1,648, issued Sept. 24, 1872), died Feb. 11, 1874, at Maysville, Ky., from the effects of an overdose of an opiate.

Assessment No. 60.—Samuel Porter (certificate No. 311, issued Sept., 1868), died Feb. 22, 1874, at Albion, N. Y., of pneumonia.

Members holding certificates numbered up to and including No. 2,194, will please remit for above assessments.

The following circular to the members has been issued:

"The testimony in favor of dropping the second initiation fee has been so nearly unanimous that the Executive Committee have determined to accept delinquents without its payment. The first initiation fee was, in point of fact, only fifty cents, the dollar going as a payment of the following assessment. The second fee was, therefore, practically, three times as much as the first, as no part of it was accredited to assessments. We hope the effect of this action may be to restore many valuable members to the Association.

"JAMES D. REID, Treasurer."

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 55, 56 AND 57, UP TO AND INCLUDING MARCH 23, 1874.

2, 4, 6, 8, 13, 23, 46, 54, 58, 61, 67, 70, 72, 75, 76, 78, 80, 82, 89, 93, 97, 99, 103, 114, 120, 121, 129, 131, 134, 143, 146, 148, 175, 176, 177, 178, 183, 188, 189, 190, 191, 193, 197, 198, 201, 202, 213, 218, 240, 244, 247, 255, 257, 278, 279, 281, 282, 283, 285, 289, 346, 350, 353, 361, 367, 372, 378, 392, 393, 402, 405, 406, 413, 414, 425, 438, 456, 463, 464, 474, 476, 478, 484, 511, 512, 520, 533, 542, 548, 552, 553, 554, 561, 569, 574, 577, 590, 594, 600, 604, 622, 642, 646, 659, 660, 662, 663, 664, 665, 669, 678, 680, 685, 714, 729, 731, 635, 764, 772, 797, 803, 808, 813, 815, 820, 830, 848, 858, 859, 870, 883, 886, 901, 905, 911, 912, 922, 927, 938, 939, 941, 942, 952, 978, 991, 992, 995, 998, 1005, 1011, 1013, 1047, 1055, 1058, 1073, 1074, 1075, 1076, 1085, 1093, 1100, 1101, 1102, 1127, 1143, 1149, 1152, 1155, 1156, 1157, 1159, 1160, 1162, 1164, 1185, 1196, 1208, 1213, 1224, 1237, 1238, 1242, 1251, 1252, 1254, 1267, 1270, 1276, 1277, 1282, 1287, 1288, 1289, 1294, 1304, 1307, 1308, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1318, 1319, 1320, 1321, 1322, 1327, 1345, 1353, 1354, 1355, 1356, 1358, 1359, 1368, 1372, 1376, 1385, 1387, 1389, 1390, 1391, 1407, 1417, 1418, 1425, 1426, 1437, 1438, 1448, 1451, 1453, 1454, 1455, 1456, 1482, 1483, 1485, 1500, 1501, 1506, 1507, 1508, 1511, 1522, 1535, 1546, 1550, 1555, 1560, 1564, 1569, 1579, 1580, 1593, 1594, 1620, 1623, 1626, 1632, 1634, 1644, 1652, 1656, 1660, 1661, 1662, 1663, 1665, 1695, 1714, 1728, 1730, 1732, 1763, 1780, 1794, 1795, 1796, 1797, 1803, 1804, 1815, 1817, 1823, 1824, 1844, 1845, 1867, 1882, 1900, 1901, 1903, 1907, 1911, 1913, 1914, 1926, 1951, 1957, 1965, 1868, 1994, 1996, 1997, 1998, 1999, 2000, 2001, 2006, 2016, 2017, 2025, 2028, 2033, 2035, 2044, 2050, 2057, 3065, 2074, 2075, 2082, 2083, 2103, 2113, 2116, 2119, 2120, 2123, 2125, 2127, 2131, 2138, 2140, 2144, 2145, 2147, 2152, 2154, 2155, 2166, 2167, 2181, 2184, 2192, 2193, 2194.

ASSESSMENTS NOS. 58, 59 AND 60.

188, 208, 211, 277, 289, 302, 742, 858, 859, 915, 923, 1178, 1357, 1489, 1862.

MISCELLANEOUS.

53.—131, 332, 813, 1013, 1152, 1695, 1843, 1900.
54.—131, 332, 813, 1013, 1152, 1695, 1843, 1900.
55.—1629, 2143.
58.—29, 64, 103, 131, 381, 509, 564, 662, 870, 880, 912, 917, 1024, 1154, 1267, 1550, 2035, 2097, 2181.
59.—64, 103, 131, 381, 509, 564, 880, 912, 917, 1550, 2097.

Misfortunes Attending West India Telegraphs.

THERE must be some extraordinary fatality, or some blundering of a more than usually mischievous character, which prevents all the submarine cables connected with the West Indies from obtaining any profit upon the capital invested in them. Here is the Cuba Submarine line—one which should, under ordinary management, be about the most prosperous of undertakings of the kind, and yet we find the directors are not in a position to pay any dividend. The company were

singularly unfortunate in the selection of contractors for the cables and in the choice of officers to superintend the laying of them. The cables of the company and its connections with the West India and Panama are in a state of chronic disorder. During the short intervals when the cables are not at fault the shareholders are worried by the interminable lawsuits which the directors somehow or other contrive to get into, to the annoyance of all parties except the lawyers, who find suitable occupation in this costly litigation.

The report of the company last issued shows that the directors of the company have now added to their achievements by accomplishing the remarkable feat of going to law with themselves. Mr. Thomas Hughes, the chairman, and Mr. Brand, the secretary of the Cuba Company, held the same position in the West India and Panama Company. In their capacity as representatives of that company it appears that they suggested that the Cuba Company, of which they are also respectively chairman and secretary, should subscribe £3,000 towards the purchase and fitting out, and £4,000 towards the maintenance of the Suffolk repairing ship. The vessel, as might be expected from former experience of the blundering of this company, "has not been available when required," and the repairs of the cable have been in consequence effected at much greater cost and delay than would otherwise have been the case. Under these circumstances Mr. Hughes, of the Cuba Company, fears that the company will be involved in questions with the West India Company, of which Mr. Hughes was chairman when the suggestions which led to these "questions" were made and adopted by himself. Mr. Thomas Hughes, successful as the author of "Tom Brown's School Days," appears to lack the qualities which are essential to win success in the management of submarine telegraph companies.—*The Railway News.*

Another Electric Motor and Invention.

BY invitation of the inventor, Colonel H. R. Leonard, we were yesterday shown the model of his new electric engine. Taking us into a room in the second story of the building on the southwest corner of Washington and First streets, our ears were greeted with the regular tick, tick of revolving machinery, while on an elevated platform before us was a driving wheel, about twelve inches in diameter, revolving at a rapid rate. There was no impelling power visible, and for some time we were unable to gain an insight into the matter, and half suspected that our ingenious friend had succeeded in discovering that great mystery—perpetual motion. While, however, we were calculating on the financial value of such an invention, Mr. Leonard quietly unloosed a screw, and drawing out a piece of wire, the unseen power was withdrawn and the magic wheel was still. We then took occasion to examine it, and found that inserted in and forming a portion of its outside surface were several magnets, which, in turn, were acted upon by powerful coils, two of which are stationed on either side, and so arranged as to give an attractive and repulsive force to the revolving wheel. A powerful battery supplies the electric fluid, which, on being attached, sets the wheel in motion. The invention, if it proves successful, promises to be of incalculable benefit to the world at large and a fortune to the inventor. The motive power has been secured beyond a question, and the only matter to be decided is the volume of that power. The inventor has sanguine hopes of success, and has no doubt of its complete running capacity. He proposes to test it in the course of a few weeks by endeavoring to run a screw propeller on the yacht Owl, which, if it proves successful, will be as good a test as the inventor desires. In acknowledgment of Mr. Leonard's genius we sincerely hope the electric engine may prove all he claims it will.—*Albany (Oregon) Daily Bulletin.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

On Working Wires of Different Resistances from a Single Battery.

OUT WEST, April 1.

TO THE EDITOR OF THE TELEGRAPHER.

AS a matter of course, I was pleased to see that Mr Pope's decision in regard to the way I worked the city line out of the same battery as my wires of greater length, was rather in my favor. The difference being, as he explains it in the article under head of "On Working Wires of Different Resistances from a Single Battery," in THE TELEGRAPHER of March 28th, "a saving of material on the 18 cups tapped off.

Although no thorough electrician can fail to understand Mr. Pope's explanation, there are those who are not well versed in working out such problems in the way Mr. Pope has so plainly set it forth.

Now, the rule we go by is the old fashioned one that a ground wire is a ground wire, whether it is five miles or five feet distant from the battery.

Now, how any surplus electro-motive force, not necessary for the working of the city wire, generated in those eighteen cups, if tapped off, could pass beyond the point of tapping, and render any service to the wires worked out of the remaining larger portion of the battery thus tapped, is what we can't understand.

We want to be enlightened, and this communication is not intended to make light of our elder and better educated brother's explanation, but we want to rise step by step to the same high ground. Won't some one who thoroughly understands this matter explain it in "United States," as the boys put it out here, when a fellow puts big words to them?

Probably a more minute description of the way the wires were worked, that called forth Mr. Pope's explanation and this article, would give additional light on the subject.

There were three batteries—one of 54, one of 36, and one of 18 cups of carbon (or electropoin) battery. The former used for working two wires of 300 miles length, with a great number of way offices on each wire. The second (36 cups), for working two wires 250 miles long with but few offices, and the third (18 cups), for working the city line. An increase of business during the middle of the day made it necessary to make a change, whereby the battery of 36 cups was obliged to furnish the power for one of the 300 mile wires in addition to the two it usually worked of 250 miles each. This was found, especially in bad weather, to be almost impossible, and no new material being allowed to increase the battery, the expedient of merging the 36 and 18 cup batteries into one was thought of and put into execution. The first trial was a perfect success, as the increased battery of 36 and 18 cups combined was found to work the three wires when necessary to use it thus, and was none too large, apparently, for the two wires the 36 cup battery had been used to work. Feeling convinced that the tapping of one of the large batteries (both now being of the same size, *i. e.*, 54 cups) would practically result in making a 36 cup battery of either one thus tapped, the experiment of the "water resistance," with adjustable slips of platinum, suggested itself, and although the division superintendent was strongly in favor of the "tapping," arrangement, he was finally brought over, at least far enough to have "water resistance" tried, and after the trial said no more about it. The city line was then attached to the 54 cup battery that worked the two longest wires through the water resistance.

The idea was probably very crude and in part ignorant, but it suggested itself, nevertheless, that just enough battery power would pass to the city line through the "water resistance" to work it, and the remainder would be at the service of the longer lines. We were tried to be made believe the theory that one third of the electro-motive force generated in that 56 cup battery would either be used by the city line or be lost in the "water resistance." The two long lines getting the benefit of but two thirds of the battery power, but we cannot understand it in that way. These ideas, no doubt, are very crude, the manner of expressing them very unscientific, and the words used to express these views wrongly taken hold of and terribly misplaced; but we have to live and learn in our business. Let us have some sound theory on this matter, and corrections where wrong impressions are had.

WESTERN CHIEF OPERATOR.

The Erie Railroad Telegraph Department.—Some Scraps.

TO THE EDITOR OF THE TELEGRAPHER.

EVERYBODY knows the Erie Railway—at least everybody has heard of it. Every intelligent person who reads has committed to memory the flowery language used in their advertising cards about "the broad gauge, double track, air line from New York to San Francisco" (or little short of there), with the prospects good for bridging the Pacific before long and building a grand central depot in Yeddo, Japan, or somewhere among the Celestials. We say everybody has heard of this Erie Railway, but perhaps there are those who do not know so much of their telegraph department. They have one, however, although we cannot remember ever seeing it mentioned in THE TELEGRAPHER, except when we wrote it up in "The Excursion to Watkins Glen," last summer. Perhaps, then, a few facts from here may be of interest.

The operators on these lines, taken together as a lot, average by far the best it has ever been our fortune to meet on any railroad. They are nearly all first class, and, as far as we have observed during our brief sojourn with them, are jolly good fellows. While telegraphers seem generally to be degenerating, and the past three or four years have worked a change that is painfully

apparent, yet they seem to be the good old class on the Erie lines, almost to a man.

They all do W. U. business, and therefore get the Journal, and that is the reason why we never hear from them through THE TELEGRAPHER. Ask one if he gets THE TELEGRAPHER, and invariably he replies:

"Yes, we get THE TELEGRAPHER—or, well, that is, the Journal."

"Yes," we say, "but THE TELEGRAPHER is a sheep of an altogether different color. Why, man, it is 'a journal of electrical progress,' 'devoted to the interests of the fraternity.'"

And then they say, "Oh!"

And they see the difference, and we go on to explain how much of life they have lost in not subscribing for THE TELEGRAPHER years ago.

The wires here work tolerably well—as well, probably, as the generality of wires work, but yet are somewhat behind those of the Lehigh Valley R. R., as are also the old Daniells locals behind Sup't H. A. Clute's Hay and Excelsior Batteries.

The department is under the supervision of Mr. W. J. Holmes, of New York, and the eastern division (the only one of which we have an intimate knowledge) under the immediate charge of Mr. C. A. Sweet, division operator, who acquits himself creditably of his arduous labors, and is liked by all who know him; at least we suppose he is, but, for fear of drawing it too strongly, we will modify it, and say that he is known by all of whom he is liked.

And now we will tender you "sum skrap," which we "skraped" together for THE TELEGRAPHER, and then close our key. The first may be more poetical than plain to most of your readers, but we never explain our own jokes. Somehow we don't like to do it. Of course "we heard this on a way wire":

"I say, see here! Frite Gerse. John Smith."

"Oh! Mr. Gerse, why, really I—"

"Op! op! R. R., you dook cog wem; adjuv your relay and I'll fix my jy."

And this on the same wire, only the "jy" was all right this time. Imagine the character of the first part dandified and dignified to an alarming extent, while he of the second part works a small office, taking for his compensation thirty per cent. of its receipts, and the business of which for last month was three messages—two D. H., and the other collected at the other end.

"How's number 5? Can't raise you there?" "Yeow can't? By gum! Naow, ain't it queer? But then I s'pose the reason is because it doan't run in here."

The next it has always been our desire to see in print. We know no reason why; certainly not because of any merit in the rhyme, but we always thought we should like to see it in print:

Tell me ye winged winds,
That 'round my pathway roar,
Do ye not know some place
Where "plugs" exist no more?

Some city, village, town,
Some hamlet in the West,
Where paper is not found,
And registers non est?

The loud wind sneaked
Around the corner sly,
And winked at me and giggled:
"No, not I."

J. K.

Solution of a Problem.

PHILADELPHIA, PA., April 7.

TO THE EDITOR OF THE TELEGRAPHER.

I. N. M., of Chillicothe, asks Mr. Haskins to solve a very simple problem by one of the rules laid down in his own work.

The problem is this: From A to B is 96 miles of glass insulation, and from B to C is 6 miles of Kenosha insulation. To find the insulation resistance of B — C, when we know the insulation resistance of A — B and A — C—

A B x C A - B = 14.140
I I I A - C = 10.740
B - C = X

To find X or the value of the unknown quantity; subtracting A — B from A — C we have B — C = — 3.400 ohms, which is the inverted value of B — C or X. Then by the proportion, as 3.400 is to 10.740 so is 14.140 to the answer, which we find is 44.666 ohms, or the direct value or resistance of B — C.

Multiplying 44.666 ohms by 6 we have the resistance per mile of the Kenosha insulator, = 267.386 ohms. Multiplying 14.140 by 93 we have the resistance per mile of the glass insulation, = 1,325.020 ohms.

This shows the Kenosha insulator to be the poorer of the two.

We also arrive at the same result by another method viz.: We have an equation, 14.140 x X = 10.740, transposing and clearing of fractions we have 14.140 X

— 10.740 X = 151.864; from this we have X = 44.666 x 6 = 267.386 ohms resistance per mile of Kenosha.

If the foregoing is incorrect I would like Mr. Haskins to point out the error. If correct, I would like him to get at anything near this result by his own rule. DAVID BROOKS, JR.

Telegraph Affairs in the South.—Personals.—The Snapper Sounder.

CHARLESTON, S. C., April 4.

TO THE EDITOR OF THE TELEGRAPHER.

The damage done by the recent heavy freshet in the Alabama river has not yet been repaired and Selma is still unheard from. When the break is closed the Southern and Atlantic will be in communication with Mobile, Ala., their wires having been built through during March.

Mr. J. G. Thornton, formerly superintendent of the southern district, will have charge of the office there, and act as circuit manager. Mr. A. J. Wright is transferred from this office as one of the assistants there, and left last night with a carpet bag full of good clothes and a bottle of soda water—his pet beverage since January 1st. He was escorted to the depot by a committee of one from the Mulligan Guards, who toted his trunk on his arm and bought two five centers with the reward generously thrust upon him.

A lady of color, who keeps a laundry on Hazel street, has her house draped in mourning this morning—I presume for the late Senator Sumner, but some there are who are base enough to insinuate that it is for Wright. The vacancy here will be filled by Mr. J. H. Riddick, formerly manager at Montgomery, who is relieved by Mr. Flint.

Kidney Green has been sent from the main office here to the Pavilion Hotel branch, relieving Mr. Thos. Slattery, the poet laureate, whose exquisite song of the "Fastest Girl in Charleston" was recently published in the N. Y. Clipper, and beautifully commented on by Queen in his peculiar style. Mr. Slattery goes to the Rankin House office, Columbus, Ga., preferring a telegraphic life to the honors of a poet, refusing engagements with stupendous salaries, offered by all the principal journals of the country. 'Tis a pity that such talent is doomed to be lost to the world, and that Tom has decided to poetize no more forever.

Our line to New Orleans will be pushed as rapidly as possible, and we will soon have two wires working there.

Business for this season of the year is very good, keeping us busy about all the time. The W. U. moved their main office lower down Broad street, nearly opposite us, and will close their East Bay branch, thus reducing the force by two men.

Among other nuisances the Snapper Sounder is in our midst. Oh, shades of the mighty inventor, Martin, from what a height thou hast fallen! Chief inspector, acting superintendent, inventor of a masheeu in a little paste-board box, that was to throw all operators out of work, dealer in old covered wire, now maker of the "Snapper." You can hear his chuckle in every touch, and see his smile in every move of the lever; the instrument and the inventor, as he is dubbed for his genius, are alike both small and light in the head. All the Snapper needs to make it complete is the name M. Wiseman stamped on its base, then will the glory of both be complete.

W. H. Pierson should send his present address to the S. & A. here, so that four letters for him could be forwarded. QUILP.

Practical Sympathy with The Telegrapher.

BEATRICE, NEBRASKA, March 23.

TO THE EDITOR OF THE TELEGRAPHER.

NOT long ago I was sitting at my instrument, reading THE TELEGRAPHER, and my eyes fell on one of those appeals to operators who are interested in the welfare of our paper, to try and extend its circulation. Being one of those interested ones, I at once opened my key and called up "Br," and asked him if he took THE TELEGRAPHER. His reply was "No," but he thought he would like to, and requested me to send him a copy of it, which I did. The consequence is, he has given his subscription for six months on trial, and, no doubt, at the end of that time he will renew, for our paper is one that will bear the test. I think there are more who would like to take THE TELEGRAPHER, but have never been solicited. Boys, don't be afraid to ask them. FRANK.

An Admirer of Nettie Bronson.

TO THE EDITOR OF THE TELEGRAPHER.

"FRANKIE" has this time tempted me to say something. I don't know, but I think my heart is in its right place. I know it is not as good as it ought to be, whether it is in the right place or not.

I would inform "Frankie" that I have that quarter of a dollar and some more to put with it for some other

good purpose, and I hope to have a chance to use it before next year. I suppose "Frankie" thinks "Nettie" has an interest in him, but I doubt it. I am sorry "Frankie" found fault with my name. It was my father's also, and I would not change it if I could.

I do not think I shall offer "Nettie" any testimonials until after I become better acquainted with her, if that should ever be. I have several female acquaintances, and some of them are old maids, but that does not make me think any the less of them. I think a person with any knowledge at all ought to know that a person living now would naturally be older than they were ten years ago—perhaps some folks don't know it though.

I will admit to "Frankie" that my suspicions were pretty strong in regard to "Nettie Bronson's" being a gentleman, but am fully satisfied now that the writer of those communications is a lady.

The only temptation that that segar of "Frankie's" would be to me would be to throw it in the stove. ELIAS.

A Letter from a Plug.—Another Telegraphic Paper Wanted.

TO THE EDITOR OF THE TELEGRAPHER.

I SEND you, as requested, the following communication which I received at a late hour last night on one of the way wires running from this office out into the wilds of Jersey. If you can't make it out don't blame me. The rules of the company, as expounded in the official organ, don't leave a fellow any discretion in such cases. Yours, 134.

"68 send tps to the xitir of tpe telegrafeer early in tpe mng so pe wim brint it tps week!! to tpe xitir if tpe telegrafeer dear hir I nitice tpe o6rs tpat frite fir yr 6a6er are am tpe tig making fun of yung o6rs coming uh 6lugs and anoter 6a6er in epicago camed tpe switpe and apr in N Y camed tpe o6rator are am tpe tig running on 6lugs too nof sir hof fould tpey lij it if tpey could not frite gerse very fast to be told dry 6p go soak your pead &c!!!! ud ud. Pof could tpe 6ejsyl4ania Railroad be run if it fas not for 6lugs of fipicp tpey pa4e tpree pundred on tpat road iu tpe state of Nef Nersey and Mr Vefart pad ratper pa4e 6lugs tpan first class o6rs to fork his fires any day ud ud and so tpe Sentral Railroad too is a great many 6lugs. and so e4erytpeere!!!! Op I fould must lij somebody to vart a 6a6er in tpe interev of 6lugs, as you cam tpep. tpe re is 6lugs enoug to maj it a big tping, and 6ay off tpe femofs tpt feel so big and frite so fast. then fe fant tpep to frite slof so fe can maj it out from a 6 R R 6lug.

A Telegrapher who Proposes to Act as well as Write.

WASHINGTON, D. C., March 28.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE been watching very closely the discussion going on in your columns for some time in reference to a "Union" in the delusive hope that some one would start the ball rolling, not feeling competent to make the first step myself; but have come to the conclusion that "procrastination is the thief of time," and what is to be done should be done immediately. "Scott," in your issue of March 21st, asks, "Why is it no one is bold enough to come out openly and declare a Union, which we must and will have?" I will reply, it is timidity and lack of self-confidence; every one, doubtless, thinking there is some one more competent than himself. I am going to start the movement, and will advise you further soon. I would be glad to hear from "Scott" and "Common Sense" again. Doubtless many will ridicule this attempt, but it shall not daunt me, as I am acting from pure motives, and have resolved to do my share. If others will do theirs, the desired object will soon be obtained. You will hear from me again IN EARNEST.

Answers to Correspondents.

COUNTRY PLUG.—No, the "Snapper Sounder" is not an electrical instrument. It is a diabolical contrivance of RALPH POPE's to destroy the peace and quiet of public gatherings and the domestic circle. It is heard on steamboats, railroad cars, in the streets, ferryboats, stages, eating houses, sample rooms, etc., but the jealousy and illiberality of managers and chief operators prohibit it in respectable telegraph offices. Patent applied for.

NEW ENGLAND OPERATOR.—THE TELEGRAPHER is an independent telegraphic journal, and is not owned by or published in the interest of any telegraph company. It is regarded at home and abroad as the authority in telegraphic and electrical matters in this country. We shall be pleased to have you solicit subscriptions; and New England presents a good field—so far as the present number of subscribers in that section is concerned—for missionary efforts in its behalf.

RAILROAD OPERATOR.—Nettie Bronson's real name and address will not be given by us to any person without her permission. Save your postage stamps. She is a woman, and not a masculine, as you suspect.

From Star to Star the living lightnings flash;
Clash, crash, splash, kuash, trash, rash, hash, dash.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, APRIL 11, 1874.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

The Financial Utopia.—How it is Likely to Affect Telegraphic Interests.

FOR more than four months past a very determined contest has been going on in Congress on the financial question, to which we have once or twice alluded heretofore. On the one side there has been a very determined and persistent effort to inflate the currency and expand the irredeemable promises to pay both of the Government and of the National Banking institutions, and on the other an equally determined and protracted resistance to such inflation and expansion, and to establish measures looking to the redemption of such promises, already authorized and issued, within some reasonable and not indefinitely protracted period. It is to be deeply regretted that this resistance has proved ineffectual, and that the inflationists have virtually triumphed. On Monday last the Senate, by five majority, passed an Act fixing the limit of the Legal Tenders at \$400,000,000, and increasing the limit of National Bank Circulation to the same amount, which is an increase of \$46,000,000 of the latter. The House has already adopted the increase of the Legal Tenders, and there is little hope of any more conservatism on its part in regard to the Bank Circulation.

Pending the decision of this matter the business of the country has been to a great extent paralyzed, labor unemployed, and much suffering thereby entailed upon the laboring and producing classes. Naturally and inevitably telegraphic interests have suffered with the rest, and telegraphic enterprise has been practically suspended for the time.

Nothing that we could say would probably have any effect in resisting this inflation madness. It rules the hour, and the country is doomed apparently to pass through trials and suffering to which what has been endured since last September will be of little account, before business can again be placed on a solid and reliable financial basis. The result is as inevitable and unavoidable as the physical prostration which follows excessive fever in the physical system. All experience of the past, since paper tokens were invented as representatives of actual money, has shown this. It has been so often demonstrated that it seems unaccountable that intelligent persons should doubt or question it; but so it is. We suppose that this is one of the legacies which the late contest between the South and North has bequeathed to us, and is an ad-

ditional punishment which we as a nation are to suffer for our manifold transgressions.

We do not propose in THE TELEGRAPHER to discuss this question, nor is it our business to do so. It has been discussed at Washington, and throughout the length and breadth of the land, until everybody is sick and tired of it. The inflationists have the power and are determined to use it, and all that those who have opposed them can now do is to limit their evil and unwise policy as much as possible, and prepare, as far as it can be done, for the troublous times through which the country has yet to pass as a consequence of such action.

Our object at this time is to consider what the effect of this policy of currency inflation is likely to be upon telegraphic interests. As we have said, pending the settlement of the financial questions by Congress the telegraph has suffered with other business, and telegraphic enterprises have been virtually suspended. It is probable that we are about to enter upon a season of wild speculative excitement preceding the crash which must eventually come. Money, or rather the illusory representatives of money, will for a time be plenty, and speculative schemes will flourish. There will very likely for two or three years be an active business and an apparent prosperity, in which telegraphic interests will participate. We believe that within the next few months we shall witness a revival and renewal of telegraphic activity, and that there will be an increase of telegraph facilities, which will be called for by the revival of business which is likely to follow the increase in the amount of the circulating medium. If this opportunity be wisely taken advantage of by telegraphic managers, the interests under their charge may be so advanced, and put into such a condition as that, when the reaction comes, they may be prepared to meet it, and may have the system so far completed as to be enabled to weather the storm without being wrecked. The natural growth of the country, and its enormous natural resources and wealth, will eventually bring it out of the financial storm which it has to encounter, and start it once more on the road to prosperity. Fortunes will be wrecked, the rich become poor, and the poorer classes suffer terribly from its effects, enterprises will be for the time prostrated, but actual values will not be destroyed. After the storm has passed the sun of prosperity will once more shine upon the land, and then, if wisely managed, the telegraph interests of the country will enter upon a season of success which shall establish them upon a solid and lasting basis.

Many of our readers may suppose that, as they own no telegraph stocks and are merely employes, all these matters concern them but little, if at all. In this, however, they are mistaken. Every telegraph employe, however humble or subordinate may be the position held, is directly interested in the prosperity or adversity of the entire telegraphic interests of the country. If the business is good and remunerative it creates a demand for their services, secures them better payment therefor, and a greater certainty of receiving such payment when earned. How many have experienced the disadvantages of working for embarrassed and unremunerative telegraph companies! To such there should be no argument needed to convince them that they are vitally interested in the prosperity of the business.

At the present time the demand for telegraphic services is limited, and many telegraphers are unable to obtain remunerative employment. If the business were prosperous this would not be the case. As a consequence of this condition of things, there has been going on for some time not only a reduction of the number employed, but also a reduction of compensation to many who are employed. The law of supply and demand applies to telegraphy as to all other descriptions of business, and if there is an over supply of labor in any department, it naturally leads to a decrease of the amount paid for such labor. This law is superior to any possible combination to resist it. Labor combinations can only be successful when the demand for labor at least equals the supply, and those who

imagine otherwise have very limited conceptions of the higher laws which dominate the relations between work and wages.

We may, in conclusion, sum up the whole matter as to the effect of the policy of inflation and expansion of our irredeemable currency upon telegraphs and telegraphers briefly as follows:—The immediate effect will be to excite to renewed activity for the time the enterprises which have of late been dormant and awaiting the decision of the financial question. How long this will continue we do not feel competent to predict, but probably not more than two or three years at the utmost. Following this, we look for a general financial break down, whose severity and completeness will be in proportion to the lengths to which speculation may be carried in the meantime. Then the telegraph, as well as other business interests, will have to pass through a season of depression, eventually coming out on a sounder basis and reviving with the returning prosperity of the country. In all operations undertaken henceforth these facts should be kept in view, and so far as is possible the managers of telegraphic enterprises should make their calculations and arrangements so as to be able to successfully weather the storm, and come out of it in the best condition possible.

The Correspondence of The Telegrapher.

IN our article last week upon the correspondence of THE TELEGRAPHER, we did not allude to the anonymous communications which we, in common with all newspaper editors, are constantly receiving, notwithstanding the rule which is imperative with all respectable newspapers, that the real name and address of the writer shall accompany the communication, unless previously known—not for publication, but as a guaranty of good faith on the part of correspondents. In some cases the disinclination to give the name and address of the writer proceeds, no doubt, from an excess of modesty, or doubt of the ability to produce acceptable and interesting communications. In others, and by far the greater number, it is caused by a desire to shift the responsibility of the statements made on to the journal itself and its publisher. More especially is this the case where accusations and statements are made of a personal nature, which are calculated to injure the parties concerned either in their positions or feelings. This is a mean, cowardly and contemptible thing to do, and we consign such effusions to our waste basket with a feeling of disgust and contempt for the person who believes that he can make use of our columns for his own selfish and ignoble purposes. Once more we take this occasion to say to all who write communications which they wish to appear in THE TELEGRAPHER, that it is indispensable, unless previously known to us, that the real name and address of the writer should accompany the communication. And to those who desire to use the columns of the paper to obtain revenge for fancied personal injuries, or to gratify mean and malevolent feelings, that it cannot be done in any instance unless we are imposed upon. We are no more exempt from imposition than any other newspaper, but it is our aim to exclude from the columns of this paper anything like that which we have above characterized.

The Hubbard Bill Reported in the Senate.

ON Thursday of last week Senator RAMSAY, Chairman of the Committee on Post-offices and Post-roads, reported to the Senate the HUBBARD bill for establishing a partnership between a private corporation and the Government in carrying on the telegraph business of the country, and it was placed on the calendar. This bill is the same substantially as has been reported from the same committee two or three times before. There is, probably, no expectation, even on the part of Mr. HUBBARD or Mr. RAMSAY, that it will even be considered much less acted upon at the present session, but it is deemed advisable to get it out of the Committee and on the calendar. The business of the Senate has been so much delayed by the protracted discussion of

financial matters that, even if there was the disposition, there would be no opportunity to consider telegraph matters at this session. We presume that the "WM. ORTON and GARDNER HUBBARD debating society" may now be considered as closed out for the season. The debates have lost their interest, and the public is heartily weary of the whole subject of a Government telegraph monopoly. We do not look for a speedy revival of interest in it; and while it is well to watch the movements of the monopolists closely, that no surprises may be accomplished in the closing hours of the session, otherwise we think we may consider the subject as practically closed up for some time to come at least.

One More Unfortunate.

WE recently announced the commencement of the publication of a telegraphic journal entitled *The Fraternity*, at Chicago, Ill. Its life has been a short one, the third number, that for April 1, containing its valedictory. We judge that it failed to meet with the support expected, and the publishers have displayed good sense in retiring from the field before they had invested a considerable sum of money as well as labor, for which there was not much probability of obtaining an adequate return and remuneration. Publishing newspapers is an expensive and laborious business, and the field for telegraphic journalism is not so extensive as many telegraphers suppose. A class journal must grow—it cannot be expected to spring into immediate and profitable success. Patience, perseverance and the investment of considerable capital will be found necessary to make any newspaper permanently successful.

The Fraternity was a handsomely printed sheet, and a very good one of its class.

Geo. H. Bliss & Co.

THE new advertisements of Geo. H. Bliss & Co., of Chicago, Ill., which will be found in this paper, will be of interest to those who may have occasion to purchase the almost endless variety of telegraph and electrical apparatus and supplies which they offer. This enterprising concern have already established a very flattering reputation for themselves, and hold a leading position among the manufacturers and dealers in electrical and telegraphic apparatus and supplies.

Bliss's new "Telegraphic Manual" and price lists will be furnished free on application.

Personals.

Mr. L. H. LONG, formerly of the Pacific and Atlantic, Dubuque, Iowa, office, has accepted a situation with the North Western Telegraph Company at Green Bay, Wisconsin.

Mr. G. A. SINGER has resigned his position on the Western Union day force at Chicago, Ill.

Mr. J. B. DRAKE has accepted a position on the Western Union, Chicago, Ill., night force.

Mons. OCTAVE VALIQUET "Sr.," for the past two years "all night man" in Chicago, Ill., Western Union office, has resigned, to engage in the wholesale boot and shoe business with his brother, also an ex-operator in Boston, Mass.

Mr. J. DEWITT CONGDON, of the Chicago, Ill., Western Union night force, formerly of the Western Union, New York office, succeeds Mons. VALIQUET as assistant all night man—Mr. HARRY STANSBURY being all night chief.

Mr. J. W. McROBIE, late of Detroit, Mich., Western Union office, is employed in the Chicago, Ill., office, on extra work, *pro tem*.

Mr. E. L. CUTBERT has resigned his position on the Western Union, Chicago, Ill., day force to accept the position of night manager with the same company at Dubuque, Iowa.

Mr. E. R. ADAMS has resigned his position as manager Western Union office at Sedalia, Mo., and accepted a position with the Philadelphia and Reading Railroad, at Reading, Pa.

Mr. A. J. WRIGHT has been transferred from the Charleston, S. C., to the Mobile, Ala., office of the Southern and Atlantic Co.

Mr. J. G. THORNTON, formerly Superintendent of the Southern District of the Southern and Atlantic Telegraph Company, has been appointed manager of the Mobile, Ala., office of the same company, and will also act as circuit manager.

Messrs. JAMES W. CHRISTIE, CHARLES R. RICHARDS, GEORGE FRED. BEULEN, SAMUEL BALES and CHARLES J. BARCLAY have resigned from the Superintendent's office, Central Railroad of New Jersey, at Elizabeth, N. J., and accepted positions with the Automatic Signal Telegraph Company, New York.

Mr. E. V. ELLIOTT has resigned from the Superintendent's office at Elizabeth, N. J., and accepted a situation in the Assistant Superintendent's office of the American District Telegraph Company, New York.

Mr. WILLIE A. FENN has resigned his position with the Franklin Telegraph Company, and accepted a position with the Automatic Signal Telegraph Company, in this city.

The Telegraph.

Foreign Telegraphic Notes.

A CORRESPONDENT, writing from Cape Coast Castle on the 20th February, says: "I suppose you heard that the Ashantees could not understand our telegraph, and so they, in imitation, carried a line of white cotton from tree to tree all along the road, passing it here and there through rags of white calico."

A deputation waited upon the Postmaster-General (Lord J. Manners) at the chief office, St. Martin's-Grand, recently, to ask for the extension of the national system of telegraphic communication with Lundy Island. The deputation were desirous that the Government should obtain possession of the wires to the Scilly Islands and to Shetland, which are now private property, over which messages were conveyed at a very high rate, and that very little accommodation was given to the public. His lordship said that the question of communication with Lundy Island formed part of a very considerable question which was now under the examination of the department. He hoped before long the result of the examination would be brought before him, and after what had been said there, and what he had heard elsewhere, he had very little doubt but that the claims of Lundy Island would be favorably considered; but beyond that he could not venture to go on the present occasion.

The Hooper Telegraph Works (Limited) have received a certificate from the engineers of the Western Brazilian Telegraph Company, Sir William Thomson and Professor Fleeming Jenkin, that the cables of that company from Pernambuco to Rio Janeiro have been successfully laid, and have answered the tests for the stipulated period after submersion. The portion of cable from Para to Pernambuco having been previously certified, the Hooper Company has now completed the contract, and telegraphic communication along the indicated portion of the South American coast is permanently established.

Cuba Submarine Telegraph.

THE report states that the gross receipts for the half year, including the balance from last year's account, amount to £6,349; expenses (including £147 paid for income tax) to £2,065, leaving a balance of £4,283 for the half year. It will be observed, upon comparing these receipts with those of the previous year, that the present account shows a considerable falling off. This result is owing to the fact that the company's cable ceased to work at the end of October. The steamship Suffolk, as explained in last report, not being available for the repair of the cable, the directors immediately invited tenders from all the telegraph construction companies for this work, and considered themselves fortunate in securing the services of the Telegraph Construction and Maintenance Company. That company, in the early part of December, despatched the steamship Investigator, which arrived at Cuba on the 20th of January; but, although the directors have heard of the repair of a portion of the cable, they regret to say that up to this moment they have not yet heard of the work being completed. They are now, however, in hopes of hearing from day to day that such as been the case. The heavy expenses connected with the repair of the cable will, it is feared, involve the company in questions with the West India Company, at whose suggestion this company subscribed the sum of £3,000 towards the purchase and fitting out of the steamship Suffolk, and laid aside a further sum of £4,000 towards her maintenance, on which outlay they have received no return. As stated above, the vessel has not been available when required, and the directors have thus been compelled to adopt a course which involves a much greater cost and delay in effecting the repair than otherwise would have been the case. The directors do not, therefore, recommend any interim dividend, inasmuch

as they are as yet unable to state what expenses the company will be put to for these repairs. Under these circumstances they propose to carry the whole amount of £4,283 to the reserve fund specially applicable to the payment of these expenses. The directors have received, in common with the other shareholders, circulars from Mr. William Abbott and Captain Gandy with reference to the amalgamation or lease of this company to the West India Company. They have not, however, had any personal communication with either of these gentlemen on the subject, nor have they received any communication from the West India Company thereon. Under these circumstances they have considered it the wisest course to take no action in the matter.

Sundries.

"I understand your office is divided into two classes—receiving and transmitting. Have you a vacancy for a good transmitting operator?" Such was the "application" received by M'g'r Swain from Clinton, Iowa, some time since.

Evidently the name and fame of Sterns's Duplex had reached "Po" in dubious form.—*The Switch*.

Time is so precious that there is never but one moment in the world at once, and that is always taken away before another is given.

The anxiety displayed by the Western Union official organ for the welfare of the Atlantic and Pacific stockholders is affecting.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

APRIL.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
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6.....	79 79%	58 58
7.....	77% 79%	58 58
8.....	77% 78%	16 16	57½

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ending February 17, 1874, and bearing that date.

No. 5,769.—(Reissue).—GALVANIC BATTERY.—Georges L. Leclanché, Paris, France, assignor to Hilborne L. Roosevelt, New York City. Patent No. 55,441, dated June 5, 1866.—Division B. Application filed January 27, 1874.

Carbonate of copper is salt preferably used, moistened with muriate of ammonia.

1. The combination, in electrical piles or batteries, of insoluble or slightly soluble salts of copper, or other equivalent material, and a liquid containing a salt in solution capable, by its decomposition, of rendering the said salts of copper or other equivalent material soluble, substantially as described.

2. In a galvanic battery, the materials packed and sealed, substantially as described, and for the purposes set forth.

For the week ended February 24, 1874, and bearing that date.

147,793.—MACHINE FOR MAKING TELEGRAPH PINS.—Charles O. Ripley, Newark, N. J. Application filed February 3, 1874.

A device for cutting a screw thread upon the end of the pin is attached to the lathe.

A telegraph pin cutting machine, consisting of an ordinary lathe, in combination with the cutting knives E F, screw cutter G, feed guide J, and feed screw K, constructed and arranged to operate substantially as described.

147,827.—ELECTRIC LIGHT.—Matthias Day, Jr., Mansfield, Ohio. Application filed March 27, 1873.

Upper and lower electrode holders connected to one motor, so as to have simultaneous motion toward each other. Applies also a constantly acting clock movement.

1. In an electric light, the combination, with each electrode holder and one electrical circuit, of two or more electrodes, substantially as and for the purposes set forth.

2. The combination, with the magnet R, of the carbon supporting rod J, arranged to act as the armature of the magnet, substantially as described, and for the purposes set forth.

3. The combination, with the armature or guide rod, of the electro-magnet M, arranged upon the top thereof, in the manner and for the purposes set forth.

4. The combination, with the motive power of an electric light and the carbon electrodes thereof, of a connecting rod and gearings, imparting simultaneous motion to both electrodes, substantially as herein set forth.

5. The combination, with the motive power of an electric light, of a constant and regularly acting clock movement, substantially as and for the purposes set forth.

147,917.—DUPLEX TELEGRAPH.—Thomas A. Edison, Newark, N. J. Application filed June 27, 1873.

Three electro-magnets of different adjustments, central circuits of three local batteries. Key c closes circuit of main battery, and through d and e of l and k, which neutralize each other, b being of such tension that it is not effected, if, at same time, circuit at

other end is closed. The joint effect of both operates b, and through it the sounder. If c is at rest and a current comes from other station too weak to operate b, it will operate the weaker magnet d, destroying the balance between d and c, and hence operating the sounder.

The batteries k l o and circuits and circuit closers of the electro-magnets b c d, in combination with the electro-magnetic sounder or call m and key e, the parts being adjusted to operate substantially in the manner specified.

147,975.—ELECTRIC ALARM.—Frank L. Pope, Elizabeth, N. J. Application filed January 14, 1874.

Vibrating or continuous alarm placed in a closed circuit, and kept inactive by the continued closure of the circuit, and operated by break in main circuit.

- 1. The combination of a vibrating or self-breaking electric alarm apparatus with a shunt circuit, arranged and operated substantially as herein specified.
2. The combination of a vibrating or self-breaking electric alarm apparatus, a galvanometer, and a switch (either or both) with a shunt circuit, arranged and operated substantially as and for the purpose specified.

For the week ended March 3, 1874, and bearing that date.

148,215.—TELEGRAPHIC AND THERMOSTATIC FIRE ALARM.—Albert F. Johnson and Frank B. Johnson, Parkville, N. Y. Application filed December 26, 1872.

One thermostat, and fire alarm controlled thereby, in a building, pipes or flues from the various rooms carrying any unduly heated air to the thermostat.

The combination, with a fire alarm signal mechanism, of a thermostat controlling the same, arranged within a flue, by which the heated air from any apartment is conveyed to such thermostat, as and for the purposes set forth.

Married.

LICHTY—SUPPLEE.—On the first of April, at Cenetary Parsonage, by Rev. Wm. Ridgeway, Mr. B. A. LICHTY, of the Superintendent's office P. R. R. Co., Philadelphia, Pa., to Miss E. A. SUPPLEE, of Columbia, Pa.

BEN—We tender you and your young bride our congratulations and best wishes for the future. May the current of peace and happiness keep its strength, and the circuit never be broken, with no grounds or crosses; and may the little sounders ever be as true as the main line-er. May you read your sounder clear and prosper through life; and at the close of the same, with your hooks clear on Nos. three and six, may you both be united at headquarters, are the sincere wishes of the remaining bachelors at F. OFFICE.

THE AMATEUR TELEGRAPHIC INSTRUMENT.

This instrument is in some respects similar to the "SNAPPER SOUNDER," but differs from that device very materially in the matter of form, finish and CONSEQUENT DURABILITY. The base is composed of the best metal, highly polished, the Spring being Nickel Plated, and capable of producing a clear and pleasant sound. All who have used this instrument pronounce it to be par excellence. Sent to any address, post paid, on receipt of 50 cents.

The "SNAPPER SOUNDER" will be sent for 25 cents.

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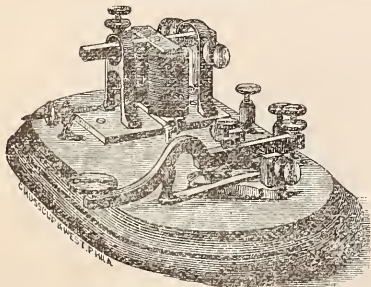
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A REVISE AND ENLARGEMENT OF THE

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Author of "Telegraph Companion," "Telegraph Manual,"

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of many Scientific and Learned Societies of Europe

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nebrog, Denmark; Order of St. Olaf,

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This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Caton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Oersted and manipulated by Schwelgger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but not mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

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How the Boys "tumble" to it

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W. J. FOY, W. U. Telegraph office,

Ed. A. KEENE, Jr., W. U. Telegraph office.

Your little Sounder has created quite an excitement among the boys here.

Later.—Still they come. Send one more to the following address: MARC GAUTIER, W. U. Telegraph office. ED.

P. S.—Another County heard from.—Send one more to CHAS. E. BURROWS, W. U. office. The total inclosed for six Sounders, \$1.80.

EDDYVILLE, IOWA, March 21.

DEAR SIR—Please find enclosed 60 cents for two more of your "Snapper" Sounders. If you get this before filling order of the 20th, please enclose the four in paper box. Think will send for couple more in a week. They make more fun for their price than anything I ever saw. Please hurry they all along. Can hardly wait.

ED. LYGGETT.

Manager W. U. office.

DELHI MILLS, MICH., March 24.

DEAR SIR—Please send me three more of the "Snappers." Best thing out. Boys all like them. Please find enclosed 90 cents.

Respectfully,

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Sent, post paid, for 30 cents, or six for \$1.50.

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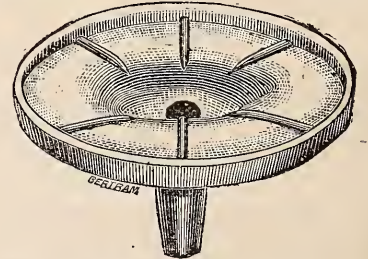
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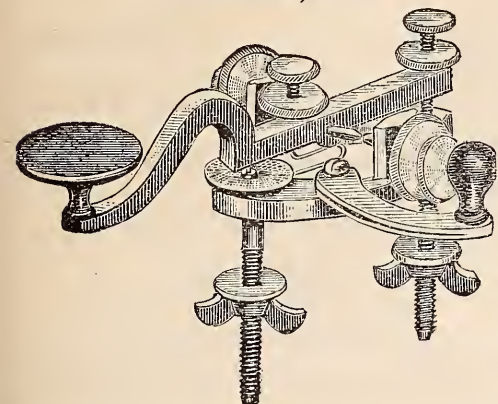
QUICKSILVER, ACIDS, BLUE VITRIOL,

SULPHATE OF ZINC, ETC., ETC.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

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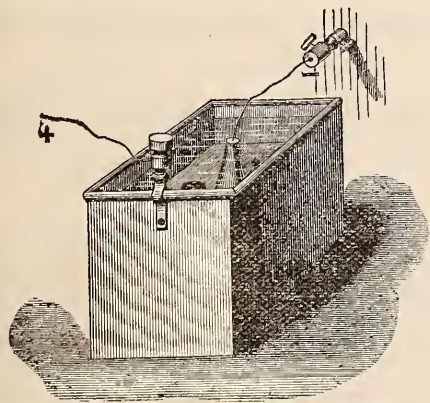
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary Key.
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.
The undersigned having secured the exclusive Agency for the manufacture and sale of the
EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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GEO. H. BLISS & CO.,
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TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
- RELAY, SOUNDER and KEY on same base, making an elegant set.
- WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
- HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

- AGENTS FOR
- KIDDER'S MEDICAL APPARATUS,
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 - HILL'S ANNUNCIATOR and FIRE ALARM,
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- WASHEBURN & MOEN'S celebrated GALVANIZED WIRE; also, AMERICAN COMPOUND WIRE.

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SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

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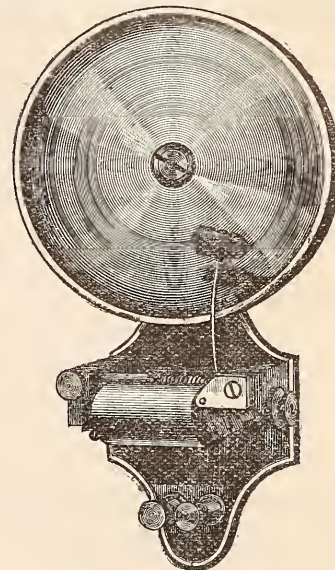
SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.

Bliss' Manual and Price List furnished free on application.

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Manufacturer of
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132 WILLIAM STREET (rear),
Between Fulton and John Streets, NEW YORK.



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)
Price.....\$5 50
The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.
In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.
The Platina Points are large and hard.
Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight.. \$50 00
Sounders, from..... 4 50 to \$6 50
Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00
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Improved Switch Keys, from..... 3 00 to 5 50
Send for Illustrated Circulars.
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MANUFACTURERS AND DEALERS IN

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A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires, INSULATORS, BRACKETS.

PATENT ELECTRIC WATCH-CLOCK THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,
At prices which defy competition.

Batteries of Every Description,
At unusually low prices.

Battery Carbons all sizes, with Improved Connection MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS,
AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

TILLOTSON'S POCKET INSTRUMENTS,

IN HARD RUBBER CASES,
NEATNESS, COMPACTNESS and UTILITY COMBINED.
Will work on circuits of any length.

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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
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Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
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Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
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Lowell, Mass.,
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Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
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New Bedford, Mass.,
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Providence, R. I.,
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Rochester, N. Y.,
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St. Louis, Mo.,
St. John, N. B.,
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San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty-years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, THERE CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,
104 Centre Street,
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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made.

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
AND AGENCY FOR THE SALE OF

Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF

ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,

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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
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Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES
constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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COPPER FOR CONDUCTIVITY.
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The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
FOR
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This Instrument is offered to the public as the oldest, most rapid, and best.

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It has already been extensively adopted and has invariably given entire satisfaction.

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which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS

of all kinds,
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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

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MANUFACTURERS AND DEALERS IN
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EVERY DESCRIPTION,
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NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as
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of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,
For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.
Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the Best and most Economical Battery, for telegraphic and other purposes, offered to the public.

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OFFICE WIRES, MAGNET WIRES, of every variety.
SUBMARINE and SUBTERRANEAN TELEGRAPH CABLES, all sizes, on hand and made to order.

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REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL TELEGRAPH APPARATUS,
For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this Pioneer Low Priced Telegraph Instrument, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
Two sets of Instruments, etc..... 12 00

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MANUFACTURERS OF

UNRIVALLED MORSE INSTRUMENTS
CHAMPION LEARNERS' APPARATUS,
with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,
Improved Curved Keys,
Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

DR. L. BRADLEY,
No. 9 Exchange Place,
JERSEY CITY, N. J.,

Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his
UNIVERSAL APPARATUS

FOR
ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$280, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
Descriptive pamphlets may be had on application.

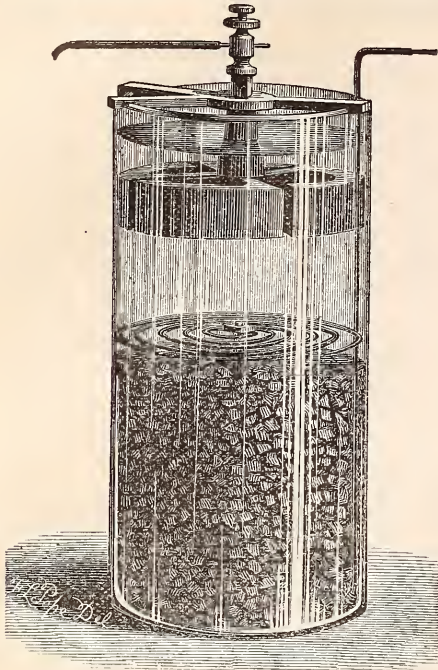
He also pays special attention to the manufacture of his
CELEBRATED HELICES
WHICH ARE OF
Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

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MANUAL OF TELEGRAPHY.
PUBLISHED EXCLUSIVELY BY
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Price 30c. **8 DEY STREET, NEW YORK.**

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

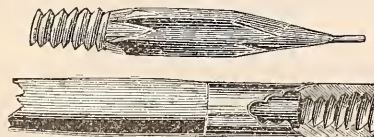
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

No. 220 KINZIE STREET, CHICAGO.

TELEGRAPH, WIRES, INSTRUMENTS,
BATTERIES, TOOLS,
INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'fg Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND UNION BRAND EXTRA QUALITY. JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS. KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE. CABLES TO ORDER.

Western Electric M'fg Co., Chicago.

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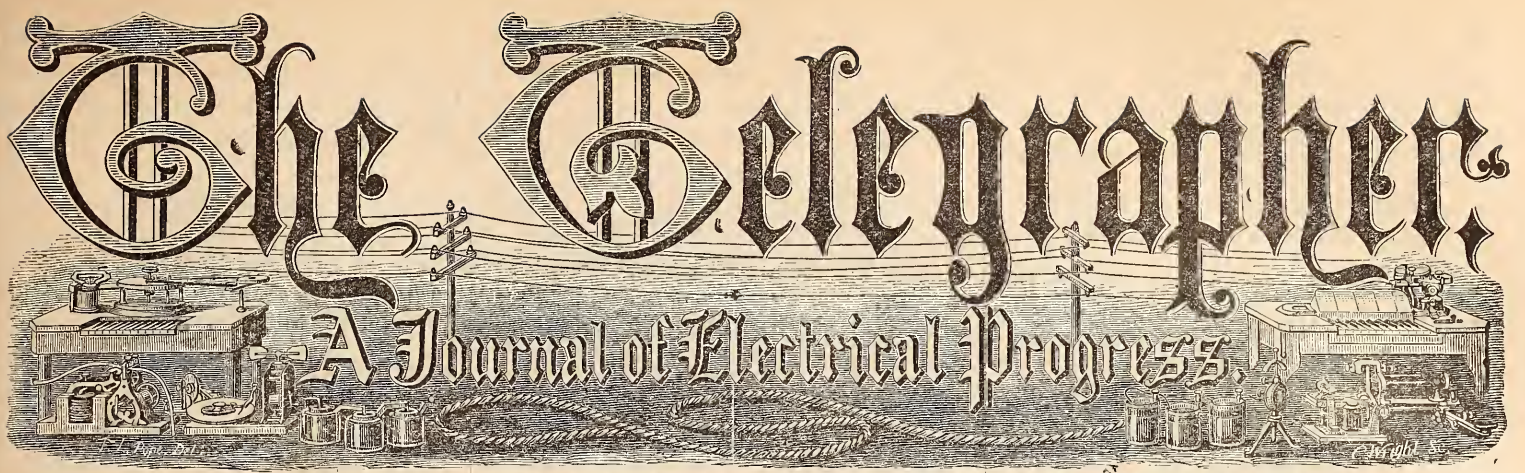
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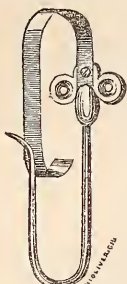
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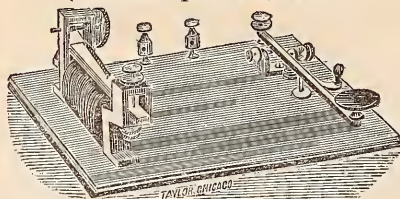
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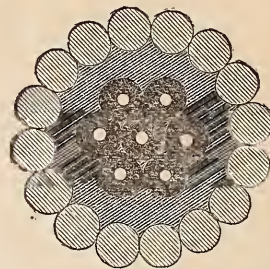
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, APRIL 18, 1874.

VOL. X. WHOLE No. 405.

Original Articles.

Review of Modern Telegraphy.

On some of the disturbing causes that had to be compensated for in the practical introduction of various systems of telegraphy, involving the use of Electro-Magnets, Polarized Magnets, Shunt Helices and Condensers, or Accumulators. By GEORGE LITTLE, Consulting Electrician to the Automatic Telegraph Company. Inventor of and Sole Patentee of the American Rapid System of Automatic Telegraphy.

In a communication made by me, and dated December 1st, 1873, I undertook to state what I considered were the chief functions of the "condensers," its use in the absorbing of extra currents induced in the helices of electro-magnets, and from thence passing on to the main line when connected in the circuit of a line of telegraph; and which had, previous to the introduction of condensers or accumulators (shunts or shunt helices and polarized relay magnets), offered most serious obstacles to the rapid and correct transmission of telegrams, automatically or otherwise. I will now proceed to enter upon the subject more fully, and in so doing I refer to those distinguished telegraphic scientists of all nationalities, of eminence in their profession, who, I feel assured, owing to their own practical experience, will verify the assertions I here make.

It is well known that induction diminishes rapidly on air lines of telegraphs; therefore, its effects on a telegraph wire extended and suspended upon poles is very trifling, and exceedingly small, diminishing rapidly as its distance above the earth's surface increases; and it requires a very sensitive magnetic needle placed by the side of a long and well insulated line wire to give any clear indications of either the direct or return current. In order to show to the slightest extent this effect of induction on an air line five hundred miles in length it would require a battery of from two to three hundred cells to make any effect of an induced return current apparent by its action on a most sensitive magnetic needle. On breaking battery contact in the ordinary way, the current would cease to flow at both ends of the line simultaneously. Now, to carry out and verify the experiment, we must not on any account allow a single electro-magnet, polarized relay magnet, helix or accumulator in or connected in any way with the main line; neither are the entering current battery contacts to be made and broken at a greater speed than is necessary for first class Morse operating.

Not only has the above fact been verified, but it is also well known that, in order to render apparent the induced return current from a single yard of line wire employing the electro-motive force of one hundred cells of Daniell's battery, it becomes necessary to insulate in the nicest possible way that single yard of line wire, and to cause the return current to flow by the aid of a discharging key through multiplying or inductive helices surrounding a sensitive magnetic needle.

In the case of a main line wire, or more properly an air line wire, we must not forget that the same must not only have its ends, but also its whole length insulated from the earth in order to take a charge so as to place the same under a somewhat similar condition to a Leyden Jar; and then, owing to its form as compared with an ordinary condenser or accumulator, capable of taking a sudden charge on the whole of its surface at the ordinary Morse rate of signaling, an air line would not only have to be well insulated, but most perfectly so to retain a charge when operating with an ordinary Morse key in the transmission of signals.

A perfectly insulated long air line requires time, and also a large electro-motive force or driving power, in order to charge the same to any high degree of tension, owing to its inductive capacity or surface being of an elongated form.

Now, in the practical working of an ordinary line wire, as we understand what the same should be when in ordinary working condition, it becomes evident to any ordinary electrician that we could not afford to devote the time which would be required to charge and operate an air line if the same were placed under similar conditions to that of a submarine or a subterranean line. That being the case, we much prefer to let the ordinary leakage of nature assist us (in this case to

some extent at least) in as far as the same relates to air lines.

Since our telegraph engineers thoroughly understand the above we will now follow up this subject with the reinvestigation of the causes brought to bear in the developing of extra currents, together with the disturbing effects of the same as heretofore, under certain conditions, was known to exist in all first attempts to work the duplex and other systems of telegraphy. The influence of extra currents, as developed by primary currents entering helices, and more especially helices surrounding an iron core, the disturbing effects of which upon the line signals become more evident when connected at the sending end of a main line wire, as they are, in all well known arrangements of electro-magnetic apparatus, employed for the purpose of double transmission, is generally understood by electricians.

It is well known to telegraph scientists that the effect of an electro-magnet introduced in the circuit at the sending end of a main line wire (and more particularly in the case of a submarine cable, or a subterranean wire,) will be to shorten the signals or to entirely confuse the same—it being quite understood that the entering current has become retarded during a time sufficiently long to magnetize the iron core. For, until the iron core becomes magnetized, no current of sufficient force will enter the line to be of any practical moment, and every time a break is made with the entering current the same will cause a constantly varying effect upon the iron core, and the varying current set up as often as a break occurs produces in its turn a different effect on every succeeding entering current, which will conduce to the greatest possible confusion of signals.

By another "*experimentum crucis*," if, instead of introducing helices having iron cores into or at the sending end of a long air line wire, a polarized relay magnet be connected in the circuit (as first suggested and put into practical operation by the Messrs. Siemens, of London and Berlin, we shall evidently perceive a decided change brought about in consequence of the polarized cores not admitting of such inductive variations of current on the main line consequent upon the feebleness with which the permanently magnetized core alters in varying retention of more than its already allotted permanent charge. This practical experiment proves most conclusively that it is not with the action of the entering current direct upon an extended main line wire that we have to form a correct diagnosis.

I would here observe that the polarized relays, as introduced by Messrs. Siemens here referred to, have to be operated by double or alternating currents + and — otherwise the retractile force of springs would be required. Heretofore it was also a difficult matter to so construct a very small polarized relay as to retain its permanent magnetism for any considerable length of time—due to the overpowering at times of an excess of entering battery current, or from other well known causes.

On the 22d of March, 1872, I applied for a patent (since obtained) for a direct current, and local, constant, polarized iron or steel core relay of small proportions, entirely dispensing with the Siemens large inductive magnet, and so constructed that the same could be operated by single entering line currents, and also without the aid of retractile springs, around the iron or steel core of which two helices were wound, and connected one with the main line circuit and one with a constant local or constant earth circuit local (as in my patent of December 26, 1871, and July 9, 1872), the constant local operating on the small core becoming momentarily neutralized or lessened by each pulsation of the main line entering current, and regaining its normal polarized state very rapidly. It is necessary that the armature should be also polarized so as to be attracted by opposite, or be repelled by similar polarity in the core by the use of single entering line currents only; and this polarization of the armature may result from permanent magnetism, induced by the core, or from electro-magnetism—in the latter case the armature may be enclosed by a helix, which may be also in the same constant local circuit or local earth circuit. This polarized relay magnet may be also arranged so as to permit the main line entering current to flow through one and the same helix through which the insulated local constant current flows—the currents being caused to flow in opposite directions (as in my patent of December 26, 1871), thereby economizing space and material. In this case the local constant may be so balanced as to act also as a shunt, B.

Another great advantage of paramount importance resulting from the use of polarized relay magnets in the main line circuit arises from the fact that proportioned double wound shunt coils or the liquid condenser can be used in connection with the same, without interfering with or offering any impediment to the quick response of the armature, a very great desideratum in connection with automatic telegraphy—the more especially when it becomes desirable to leave all the ordinary local magnetic sounding or signal apparatus in

the same main line circuit, regardless of cutting out or switching off the same, a great economy of time in manipulating the automatic system being thereby effected. To Messrs. Siemens is due, I believe, the credit of being the first to demonstrate the very important fact as regards the efficacy of polarized relay magnets in, to a very great extent, diminishing the disturbing effects of extra currents upon the main line signals, as superinduced to the fullest extent by the use of ordinary electro-magnets.

As regards the use of ordinary electro-magnets in apparatus for duplex telegraphy, it would seem that the same cannot be well dispensed with, the more especially where receiving by sound is the object. That being the case let us see in what way these extra currents the resultant of static and reactionary electro-magnetic induction had so seriously heretofore interfered with duplex telegraphy, when first attempted by the use of differential electro-magnetic relays, or by the use of opposing electro-magnets.

We will first investigate the action of the current as it applies to the double helices, or differential coils. In this case the electro-magnet or relay having its iron core surrounded with two helices, wound so as to allow the same entering current to pass in opposite directions, the entering or battery current to one of the helices, being so adjusted with the aid of rheostats, it being intended that the operator when transmitting could not hear his own signals, or in other words the armature of the magnet was not intended to be effected by depressing the key of his instrument—he having, with the aid of the rheostats, so balanced the entering current that the same, when divided, neutralized its own separate inductive influence upon the iron core of the electro-magnet at the sending end of the line. But on the operator breaking circuit with his battery, the third induced current of high intensity was developed, which, as is well known, is of momentary duration only, and making its escape by the shortest route to earth. The equal division and consequent neutralizing on itself of the third induced current and its own equal division through both of the differential helices being prevented in that case by the necessary introduction of rheostats between the earth and one of the differential helices; at the same time the inductive effect of the extra third current exerted its greatest influence by way of the inner helix, and therefore momentarily polarizing the iron core and its armature, which was simultaneously attracted when under delicate adjustment, the neutralizing power of the entering current upon the iron core at the sending end of the main line disturbing its normal or non-magnetic state, and thereby confusing the signals at both ends of the line.

In the second case wherein opposing magnets were employed—that is to say, a receiving apparatus consisting of two electro-magnets opposed to each other and provided with one common armature. One end of each of the helices are connected together in order that the entering current may divide one portion of the current being caused to flow through the helix of one electro-magnet of the relay or sending and receiving instrument on to the main line wire, whilst the other portion of the current was caused to pass through the helix of the second or opposing electro-magnet of the instrument to a set of resistance coils, offering a resistance nearly equal to the main line wire and connected thence in a branch circuit to earth.

By this arrangement the two opposing electro-magnets were equally excited by the primary entering current at the sending end of the main line on the operator pressing down his key. In order to make battery contact the entering current of one electro-magnet being regulated by the rheostats, so as to balance or proportion its inductive influence equal to the opposing electro-magnet, and thereby keep the common armature in its normal state of rest, and so held by its retractile spring against a screw stop equi-distant between the opposing poles of the two electro-magnets, it being intended that no audible indication of the movement of the armature should be heard by the operator. Nevertheless, as soon as the operator broke circuit with the sending battery, by letting up his key, the well known third induced current announced its existence by disturbing the balance of the inductive power or influence of the first primary entering current; consequently, the armature lost its equilibrium, and would no longer keep its central normal position between the poles of the opposing electro-magnets. As very naturally the third induced current brought into existence, on breaking circuit with the battery, exerted its greatest inductive influence by intensifying the iron core of that electro-magnet, whose helix had both ends connected with the shortest route to earth (by line escape and otherwise), causing a momentary unequal attraction of the armature and consequent confusion of the signals.

In order to entirely overcome such serious difficulties attending upon the introduction of uncompensated electro-magnets into the circuit at the sending and receiving ends of the lines of telegraph, the more especially where the object sought was the keeping of the armatures free from the influence of extra currents, and at the same time preventing such extra currents

from in any way affecting the main line signals, I, in the early part of the year 1872, applied one end of a condenser (more properly an accumulator) between the main line and the electro-magnet of one of my direct acting main line sounders in a main line branch circuit of my rapid automatic telegraph system between New York and Washington. The result was very marked; and I here repeat a remark made by me in my former communication, that is to say, whoever performs the *experimentum crucis* will also see at a glance the advantages that would accrue from the application of condensers to the Morse instruments, now in daily use, by enabling the operators to work on a more delicate adjustment than ever before known, by the condenser in this case absorbing and recombining with its own static charge the whole of the third extra current. The application of the accumulator in like manner to the duplex system, involving the use of opposing magnets, has also been attended with great success. For inasmuch, as heretofore stated, the third induced current has by its aid been prevented from passing extra pulsations upon the main line, brought about by disturbing the inductive influence of the primary entering current when the operator necessarily let up the key of the instrument on breaking circuit; one end of an accumulator being connected to the wire between one of the before mentioned electro-magnets and the rheostats, its other end connected in a branch circuit to the earth, is ready to immediately perform its proper functions by its own static charge, suddenly absorbing and recombining with the third extra current reversing its physical action for the moment and simultaneously reducing the iron cores of the opposing magnets to their normal or non-magnetic state, the armature being unaffected and kept at rest against its stop pin by a retractile spring.

From the foregoing, the important value of the *condenser* or *accumulator* will become very apparent to us, as also to those electricians who have either not made very close observations in regard to such phenomena or are not well posted in relation to the various physical properties that, under certain conditions, are assumed by electro-magnets.

BLOOMFIELD AVE., PASSAIC CITY,
New Jersey, U. S. A., 13th April, 1874.

Reddy McGuire.

BY OWTON A. FLYE

WE felt badly when Reddy McGuire went away. The corners of Dolan's mouth lengthened themselves down into each cheek, so that his chin must have resembled an island with the Gulf Stream eddying about it; and Lapey's face assumed a complexion in which it was difficult to detect the dividing line between it and his immaculate shirt front. This was no trifling matter with us, and the tears which were silently dropped in out-of-the-way places were affecting tokens of esteem for our friend. Reddy was the pride of the office, and no eulogy from my pen could do him justice. When sympathy was in order Reddy was ready with a heart full of the feeling that makes us wondrous kind. He could shed more tears in an emergency than any man out of Congress. His heart was always bleeding for somebody, and his purse strings were as sensitive to the needy touch as Griswold's views on the liquor movement. Yet he always had a yearning to be away, and the subject of his childhood days was his constant theme. "Sunny Texas" was always on his lips, and when he left us for a journey to his birthplace we felt a sense of joy thrown in with our sorrow, to know that Reddy's hopes were to be realized at last.

He has left a record here which is unspotted from the world. A few of his achievements are noteworthy. What could be sublimer than the sentiment which prompted him to give his last chew of tobacco to a soliciting comrade? I've seen him do this with a deluge of tears furrowing his cheeks as in the bitterness of his spirit he lamented that he could do no more. The chief sat him down to a Washington special after dinner one day. This was an opportunity for which "the favorite" had long waited; here was a chance to distinguish himself. Removing the relay and sounder, and after having had his hands tied behind him, he took the wire in his teeth, the pen between his toes, and while Davidson executed a painful air on the base drum, Reddy in a unchalant way turned out the finest chirographic effort ever seen west of Utica. We all kissed him, and O'Reilly, in the exuberance of his mirth (which is 'always playful), loaned him thirty-five cents.

This is but a sample of the many pleasantries in which Reddy indulged. Who can forget the time when, chewing three cents' worth of gum at once, he received sixty-three consecutive messages from Harry Jones without a struggle. My heart aches now as I think of the envy creeping into my soul while I watched him carry on a running conversation with four ladies, perform the balance act with a chair, swallow two swords and spit blood, while receiving from

Catlin, even when Catlin was boiling over with the effort.

It was the Dolly Vardens, however, who worshipped him. How many games won last season must be attributed to his energetic spirit. How we shall miss him. We all remember how, last season, when, after a hotly contested struggle, we carried him home with three teeth out, a shoulder blade broken and both thumb nails gone. He could catch a ball on his under lip with the greatest of ease, and in a home run was only excelled by the immortal Wilson. But I can't linger with you any further on this subject. He's left us, and it took three "shupers" to assuage Cork. Maybe I'll revive him again.

Telegraphic Monsters.

THE Indo-European Telegraph Company appear to be just now contending with the same difficulties which the early days of electric telegraphy experienced in America, when the ingenuity of the Press Association in that country invented a "code" by which a very large amount of information was conveyed in a very small compass respecting the markets and proceedings in Congress, at a very small cost to themselves, and a serious diminution of profits to the company. The Indian Government, in order to prevent what they consider of the nature of a fraud on them, have published a list of compound words that they say must be paid for at a higher rate. It certainly does seem hard that a telegraph company should have to take on their line such words as "fireinsurancepolicy," "foradvertisement," "powerattorney," "royalfamily," "wireanswer," "marriage treaty." There are many other words in the code which evidently do not convey the meaning that they appear to imply; such for instance as "lanternjaws." We are afraid, however, that as long as the rates remain at the present high figure it will be useless for the Government to contend against the ingenuity of "code makers." In America, where the system of "coding" was endeavored to be put down, telegraph managers went so far as to declare that every word of more than five letters should be charged at an extra rate. A few weeks, however, only elapsed before an amended "code" was prepared, in which no word was to be found with more than five letters. Again an edict went forth that no word should have more than four letters; the Press Association were equal to the emergency, and a new code was quickly made, in which every word was within the stipulated limit. A third attack followed, and the number of letters in the code words was limited to three. Filing the contest with so powerful a body unsuccessful, a new and more liberal system was adopted; reduced rates were given for the press messages, and from that time may be dated that enormous expansion of the telegraphic system which has grown up in America and in this country.—*The Railway News.*

Cuba Submarine Telegraph.

THE fifth ordinary general meeting of the Cuba Submarine Telegraph Company was held at the London Tavern, on Monday, March 23d, Mr. Thomas Hughes in the chair. The Chairman, in moving the adoption of the report, which was given last week, referred to the circulars which had been sent round by two or three of the shareholders, and said that the directors had not replied to those circulars, thinking it best that the shareholders should settle their own future in their own way. He was happy to say that they had now come pretty nearly to an end of their troubles in connection with the repairing of the cables. The shareholders would remember that the first cheering news came exactly a month ago, upon which day the directors received intelligence that the cable had been perfectly repaired up to Cape Cruize. He was happy to say that a telegram had since been received, dated March 22, stating that the expedition had arrived at Cien Fuegos, and that the cable was perfectly repaired up to that point. They might hope, therefore, that in a few days the cable would again be in full working order. Referring to the finances of the company, he said that on previous occasions the shareholders had expressed their approval of the financial policy of the directors, and that policy the directors intended to continue in future. The directors proposed to carry the whole amount of £4,283 to the reserve fund specially applicable to the payment of the expenses connected with the repair of the cable, the directors being unable as yet to state what expenses the company would be put to for these repairs. Referring to the question of amalgamation, which had been prominently suggested in one or two of the circulars which had been sent round to the shareholders, he pointed out that this company's line was a most valuable link between two large independent telegraphic systems, and expressed his belief that the time would shortly come when the value of the Cuba Company's property would greatly increase, and when, no doubt, in case of an amalgamation with any other company, good terms would be obtained. He moved the adoption of the report and accounts. Mr.

Alex. F. Low seconded the resolution. Mr. W. Abbott referred to the advantages which would accrue to the company from amalgamation with one of its powerful neighbors, and expressed the hope that the directors would keep this subject before them. After some further discussion the resolution was put and carried, and the meeting broke up.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

On Working Wires of Different Resistances from a Single Battery.

TO THE EDITOR OF THE TELEGRAPHER.

I SUPPOSED that I had made my calculation of the comparative effects of arranging different wires to work from the same battery in different ways, about as plain as it could be made, but it seems that I shall have to try it again, though I may as well first as last say to "Western Chief Operator" that it is not possible for him or any one else to understand the science of electricity without a good deal of hard study, no matter how carefully and clearly it may be explained. If there is any "short cut" to this knowledge none of us have as yet succeeded in finding it, so far as heard from.

The "old fashioned rule that a ground wire is a ground wire," at all times and under all circumstances, is hardly an infallible one. There used to be a young person on a certain line between New York and Boston, who was accustomed to put on his ground wire in the evening, after the close of business, for the purpose of holding sweet converse with a telegraphic maiden who presided over a small office farther east. But unfortunately, his ground wire, though a ground wire, was not a ground wire. This was demonstrated by an unscrupulous rival, who held forth in the New York office, and was accustomed to cut off his main battery, and by the application of a ground wire that was a ground wire, and a judicious and mighty fee adjustment of his relay, he succeeded in eavesdropping our friends to a most frightful extent. Let us hope that the event justified the old saw, that "listeners never hear any good of themselves."

If I rightly understand the point that troubles our "Western Chief Operator," it is this: A battery of 54 cups works three wires, of 250, 250, and 300 miles. It is proposed to attach a shorter line at such a point as to include 18 cups, counting from the common ground wire. He thinks that the entire current proceeding from these 18 cups goes to the short line, and that the experiment would "practically result in making a 36 cup battery of either one thus tapped."

If he had taken the trouble to make an actual experiment he would have found that a considerable share of the current of the 18 cups would go to the three long circuits, as I showed by calculation in my previous article. If an absolutely perfect ground wire were put on at the point in question, of course it would take the whole current of the 18 cups, leaving the long wires practically working on a 36 cup battery. But if, instead of this, we attach a city line, we put in a resistance, and a portion of the current goes to the other wires. The greater the resistance, or length of the city line, the less current will flow through it, and the more will go to the other wires.

"Western Chief Operator" might have proved this in some such way as this. He might have put on his city wire at the point 18 cups distant from the common ground wire, and noted the strength of current on his long wires. Then he might have taken off his city wire and substituted for it a good ground wire, connected to the nearest gas pipe. If after this he didn't discover an immediate and striking difference in the effects of his two ground wires (situated respectively five miles and five feet distant) upon the working of his long wires, then I am not a prophet, nor the son of a prophet!

The idea of using the water resistance was not "ignorant," nor especially "crude." It was a good move in several respects. It saved bringing an extra battery wire to the switch board, and it made the action upon all the cells of the main battery equal. In my opinion this is a better plan than tapping the battery under most circumstances. In theory, as regards the current that each of the four wires gets, it makes no difference which method is adopted. It is like the old dispute about putting in intermediate batteries on long circuits, which used to give rise to interminable discussions, until calculation and experiment both demonstrated that, except under peculiar circumstances, one plan was just exactly as good as the other.

One word in regard to the theory that one third of the force generated in the 54 cup battery would be used by the city line or "lost" in the water resistance.

April 18, 1874.]

Of course the use of the resistance is to prevent too strong a current going to the city line. But the current thus kept out of the city line is not "lost;" it is merely forced on to the other wires. It is like putting a dam into a river, which forces a greater portion of the water into a canal while a less amount flows over the dam into the original channel. F. L. POPE.

Elizabeth, N. J., April 13th, 1874.

Congress and the Telegraph.

WASHINGTON, D. C., April 15.

TO THE EDITOR OF THE TELEGRAPHER.

IT is so long since a communication from me has appeared that it may have been supposed by some of your readers that I have abandoned the field as a correspondent of THE TELEGRAPHER. As you know, however, such is not the case, but Congress has been so much occupied with financial and other matters that there has been nothing for me to write about.

The fact that the Hubbard bill had been reported from the Committee on Post-offices and Post Roads, by its chairman to the Senate, and placed on the calendar, has already been noticed in your editorial columns, and I have only to say that there is little if any probability of anything further being attempted with it at the present session.

On Wednesday of last week a petition of Norvin Green, Vice-President of the International Ocean (Cuba Cable) Telegraph Company, was presented in the Senate, asking for the passage of a law authorizing the issue of an American register to the steamer Suffolk, which had been purchased abroad by the company, to be used as a repair steamer, and the change of her name to the Professor Morse, which was referred to the Committee on Commerce.

On the same day Mr. Sargent, of California, introduced in the Senate, by request, an act to secure anti-monopoly ocean cable communication between Europe, America and Asia. This was referred to the Committee on Foreign Relations. The following is the full text of the bill, which as will be seen consists of a long preamble, the necessity of which is not apparent, but which is characteristic of its author, and an enactment sufficiently comprehensive, if it should become a law, to enable the grantees, perhaps, to make a good thing of it by disposing of their grant to the hated monopolists:

"An Act to secure anti-monopoly ocean cable communication between Europe, America and Asia, by W. Cornell Jewett and his associates.

"Whereas, Cyrus W. Field and his associates have secured an ocean cable monopoly in the interest of England, through which France, Holland, Germany, United States of America, and other nations are at the mercy of amalgamated English telegraph ocean cable combinations, in connection with independent telegraph communication with the world and tariff rates of messages; and

"Whereas an anti-monopoly ocean cable will be laid within a few months between Ireland and the State of New Hampshire, via Newfoundland, by Messrs. Siemens Brothers, London, contractors for "Direct United States Cable Company," under a charter prohibiting by the laws of England amalgamation or a joint purse arrangement with the "Field" or Transatlantic Cable interests, now existing, and which anti-monopoly cable will be laid under the telegraph act of Congress of March 29, 1867, pledged to a tariff of one half present ocean telegraph rates; and

"Whereas the interests of the Government demand independent ocean cables, and W. Cornell Jewett and his associates propose to lay, land and operate, in the year 1875, or as soon after as practicable, a cable, or cables, between France, Holland (or other points of Europe) and New York, or other points of the Atlantic coast; also, between San Francisco (or other points of the Pacific coast) and China, Japan, or points of Asia, with the right of touching at intermediate points, if necessary, on the Atlantic and Pacific coasts, under acquired charter rights so to do, the cable or cables on the Pacific coast to be landed, used and operated between the years 1876 and 1878, or as soon thereafter as practicable; therefore,

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That W. Cornell Jewett and his associates, citizens of the United States of America, be and are hereby granted all the rights, powers and privileges necessary to lay, land and use, as well as operate, ocean cables in the interests of the American Government and people, between Europe and New York, or other desirable points of the Atlantic coast; also, between San Francisco (or other desirable points of the Pacific coast) and China, Japan (or desirable points of Asia), under the same provisions, restrictions and limitations, from the date of the approval of this act, as granted by the telegraph act of Congress, March 29th, 1867."

The only person who appears in this proposed act is well known here in Washington, where he is constantly

appearing in connection with some job, but who is seldom successful in accomplishing anything. His "associates," as usual, are mythical personages, and it is hardly probable that Congress will pass such an act without evidence that it is substantially backed up by adequate capital.

The well established disinclination of American capitalists to invest in telegraph cable property does not afford a very encouraging prospect, especially under such auspices, of securing any considerable amount of funds in this country, even if this act should become a law.

Mr. Cyrus W. Field has been here for the last two weeks, it is understood, looking after telegraphic interests.

The Western Union Telegraph Company has recently transferred its Southern wires from the Aqueduct Bridge to the Long Bridge over the Potomac River. By the latter route cables are required under the draws, while by the former no cables were required, but there was an annual rent to pay, which, probably, it was desired to get rid of.

Telegraphic matters have been unusually quiet here during the past season, out of Congress as well as in, and there are no present indications of a change in this respect. CAPITOL.

Action for a Telegraphic Association Demanded.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE noticed of late a revival of the "Telegrapher's League," or Association discussion. I sincerely hope it will assume some definite form soon. Are there not men enough in our ranks who will lend their aid and the benefit of their experience to produce something that will be acceptable to the many who are writing this subject to death, and arriving at no conclusion? It was my fortune to be one of the dozen who tried, some two years ago, to start an association in one of our largest cities, and which failed—owing to the disinclination or fear (impossible to say which) of the operators in adjoining places to cooperate with us. Their advice was, "stop where you are—do not continue in your ruinous course," as in their opinion it could not and would not succeed. I am very sorry to say they were right, for had each and every one put themselves to work earnestly it would be something not of the past.

Our motto should be, "United we stand, divided we fall;" and we will continue to fall until something substantial is done. As your correspondent "Sierra" says, "It by no means follows that, if we have a League, a strike should be the result."

Neither should it be controlled by officials of any company, but by solid, sound, sensible men who have had experience. There are plenty of them capable of doing this, and doing it right.

Let a committee be formed and act on this important matter, and the sooner done the better. The material to be used must be the best, thereby uniting us in one immovable band of brothers. Let brotherly love prevail. SERIOUS.

Summer and Summer Luxuries.—A Bill to Regulate Telegraph Charges.—The Military Telegraph Line.

SAN DIEGO, CAL., March 28.

TO THE EDITOR OF THE TELEGRAPHER.

WHILE at the East you are still having cold, snowy, wet and boisterous weather, in this section we are enjoying all the pleasures and advantages of early summer weather. The past season was unusually moist—more rain than for five years before—and, as a consequence, we had strawberries six weeks ago, and wild flowers cover the whole earth. There are 78 varieties of grass here, each bearing a different flower, which blossoms at some period of the year. I wish I could put a bouquet of my wild flowers on your desk—if you appreciate them half as much as I do you would be pleased.

The newspapers in this State have been somewhat exercised over an act proposed in the Legislature by a Mr. Dnfly to regulate the rates charged on telegraph lines in this State. The provisions of the bill are not very clearly understood; but it establishes a uniform rate for telegraphic services, and the telegraph companies would be compelled to charge the small papers in the interior as much as they do the large city papers for news despatches, which, of course, would be fatal to the former. The act passed the Senate, but the House refused to order the bill engrossed by 27 yeas to 28 nays, and it is defunct, for this session at least.

The military telegraph from this city to Arizona Territory is in full and successful operation. The line was inspected by Capt. Price, U. S. A., who pronounced it all in good shape, and ready to encounter hard weather, except in the Colorado desert, through some miles of which it was necessary to construct it through a fine sand, so light as to be constantly drifted by the wind like ashes, at times burying the poles, at others

undermining them. Capt. Price, finding that the construction party had experienced some difficulty in setting poles through this section, invented and had made a cylinder about four feet in length, and twenty inches in diameter, hinged to a bar about seven feet long. This cylinder being pushed down in the sand, and the sand dug out from inside, made space for the pole (which was then cut down three feet, as nothing crosses the track of the line, it not being necessary to have the poles higher than is required to keep the line clear of the ground), which was placed inside of the cylinder, and the cylinder withdrawn. When raised clear of the ground, unkeyed and opened, the cylinder left the poles standing firm, as the sand closed in on all sides. The cylinder was made in two pieces, first, to allow it to be carried easily on the pack horse; second, on account of some poles requiring resetting which had wire attached, and if the cylinder was made in one piece it would have been necessary to take off the wire to remove the cylinder from the pole.

Capt. Price is now in San Francisco superintending the draughting of a map of the whole line, which, when completed, will be photographed.

Mr. R. B. Haines, Division Superintendent of the Western Union Telegraph, paid San Diego a flying visit recently. While here he superintended the removal of the wire to the "Observatory Monument," erected during the observations of Prof. Davidson, about three years ago. CLIX.

A Telegraphers' Convention Proposed.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE several very interesting communications in THE TELEGRAPHER, of April 4th—one signed "Sierra," another, "F.," both of which I heartily endorse, and would like to have a chat with them and all concerned. I do not want *only* "to see my writing in print"—would not have it if I could reach *you* otherwise—but I do want a League or an Association. I would suggest, with "F.," that local meetings be held on every circuit, and delegates be appointed and instructed to attend a general meeting, or convention, to be held at some central point, say in July. That would give every circuit time to appoint delegates. I am talking to *you*, reader, *you* are the one to help start this thing. Now which circuit will be ready first? We are ready on the SOUTHERN KY. CIRCUIT.

In Re Plugs.

TO THE EDITOR OF THE TELEGRAPHER.

YOUR worthy correspondent on the "6cjsyl4ania" Railroad, who thinks that a "6cger" ought to be started in the interest of "6lugs," must live so far out in the wilds of Jersey that the *Journal of The Telegraph* has never come under his notice. I think that the said sheet fulfils nearly every requisite of an organ for this persecuted and despised tribe. One would naturally think *The Switch* was the proper place for "plugs;" but it don't seem to be the case. Perhaps, however, it is not a "plug switch." Do you suppose, Mr. Editor, that it is possible *The Fraternity* died because there were too many "plugs" in it? I have long suspected that this was going to be a bad thing for the fraternity, and now I'm quite sure of it. SNIDE.

Miscellaneous.

GALVANIC ELECTRICITY.—Put a rod of amalgamated zinc in a glass cell filled with dilute acid, and it will be seen that the apparent action is limited to the gradual production of a few bubbles of gas. On placing this copper wire in the cell beside the zinc, there is no change until I allow the two metals to touch, when you see torrents of bubbles are evolved from the surface of the copper wire. On substituting platinum or silver for the copper we get a similar effect, and that whether we join the metals within the liquid or at a point exterior to it. Thus, if I join the copper wire to this galvanometer, and connect the other end of the coil with the zinc rod, you see that the magnetic needle is deflected as long as contact continues; but immediately on breaking the circuit, the action on the needle and the evolution of bubbles cease instantly. Such an arrangement of two metals, in a liquid capable of acting on one of them, is called a galvanic battery, and by means of it, in connection with a very delicate galvanometer on the other side of the Atlantic, we are able to send telegraphic signals across the ocean.

From the fact that the bubbles of gas are given off from the surface of the copper, we might suppose that it was that metal which was acted on; but if we were to weigh them, we should find that it was the zinc which had lost weight, while the copper remained quite unacted on. The dissolved metal is known as the positive, and the unacted metal as the negative; in fact, there is less tendency to solution on the part of the copper when connected with the zinc than in the absence of the latter metal, which, on the other hand, is far more rapidly dissolved than it would be alone.—Lecture by A. H. Allen, F. C. S.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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Some Reflections on the Different Characteristics of Telegraphers.

It may not be out of place or uninteresting to devote some space to the consideration of the different characteristics of telegraphers. We have printed several character sketches recently which have been universally recognized by telegraphers—especially those who have been engaged in the business for several years past. We have all known or heard of operators who are represented by the various characters therein delineated. The race is not extinct, but the individuals are not so commonly met with as they were a few years since, and, in fact, the telegraph service is becoming so systematized and exalted that such men find it difficult to retain a position in it. The subject is by no means exhausted, and we hope to present, from time to time, to our readers similar character sketches, which will not be less interesting than those printed in this and previous issues.

The telegraph service, employing as it does so many thousands of individuals, naturally and unavoidably comprises many different classes, whose characteristics differ as widely as their location and positions.

The operators of a dozen or fifteen years' experience, familiarly known and spoken of as "old timers," constitute almost a distinct class. They have grown up with the business generally, during the time having passed from early boyhood, or incipient manhood, to maturity or middle life. Their experience has been different from that of the more recent accessions to the telegraphic ranks. Some of them are apt to pride themselves, perhaps overmuch, on the fact that they are "old timers," and assume an importance and superiority over their younger associates which, in some cases, the facts do not warrant. It must be conceded, however, that, as a general thing, they have more thoroughly learned the business than is common at the present day. They were from necessity obliged to acquire a more general and practical knowledge of the different branches of the business. They were expected and required to be able, not only to manipulate the key, and read the signals easily and correctly when receiving, but to be able to set up and take care of batteries, repair telegraph wires, act as receivers, delivery clerks, etc. In fact, except in the very large offices, and sometimes in these even, they were expected to be able and willing to turn their hand to

anything that was required to be done to facilitate the business. It is, therefore, not very surprising that they should be disposed to look down upon those who only know enough of the service to merely send and receive messages.

Some of them are given to dilating upon the telegraphic wonders which they have seen performed, and not unfrequently in which, according to their own statements, they have personally bore a not unimportant part. We fear that these stories sometimes have a considerable amount of exaggeration in them, and that they would not be entirely sustained by contemporary and unbiassed evidence. These are generally good fellows at heart, and worthy members of society. They are apt to, rather despise science, and to regard the time spent in testing wires and circuits with galvanometers, and other newfangled instruments, as being practically wasted. They have more confidence in practical than scientific telegraphers, and "Ohm Catchers" are in little favor with them. We do not intend to say that this is true of all the old time telegraphers. Many of them have become very good practical electricians, and occupy positions in telegraphy which they could not without some knowledge of electrical science.

The later accessions to the telegraphic ranks are generally less thoroughly trained in the practical duties of the service, except in so far as is necessary to send and receive telegraphic signals, than those of whom we have been speaking. Many of them know nothing whatever of the manifold details which are essential to the successful operation of telegraph circuits. Insulation, resistance, escapes, etc., are to them mysteries which they do not attempt or care to fathom. Is not the chief operator or manager on hand to attend to such matters, and why should they puzzle their brains over them? Of course such telegraphers can never aspire to the higher and more important telegraphic positions, but must be content always to occupy subordinate situations. They, too, despise scientific knowledge and information, and their chief objection to THE TELEGRAPHER is, that it seeks to educate, as well as interest and amuse. This class are loud in their denunciations of the wrongs and oppressions under which they suffer, and look upon all telegraph officials and managers as natural enemies. They consider themselves usually as overworked and underpaid, and look to a telegraphers' association, which they expect somebody else to organize and maintain, as the precursor to a telegraphic millennium. They do not realize that in such an arrangement of the details of the business, of positions and compensation, as should properly result from coöperation between telegraphers and telegraph managers, and in the redistribution of positions and salaries that would follow, they must, necessarily, take a lower place and smaller compensation until their abilities should entitle them to advancement. There are a good many of this class now in the telegraph service, and one of the principal advantages which could result from a proper telegraphic organization would be their assignment to such positions and compensation as they are entitled to.

It is pleasant to turn from the consideration of this class, to that, which if less numerous is certainly more important, and on which the best hopes of the telegraphic service present and prospective are based. There is, we are happy to know, a class of telegraphers possessing a large amount of industry, ability and intelligence, who would be an honor to any profession. Instead of idling away their leisure time in frivolous amusements or dissipation they are constantly seeking to acquire a more thorough knowledge of the science upon which the telegraphic art is based, and qualify themselves to fill worthily and creditably the highest positions in the profession which they have adopted, and which they love. We know of many such among telegraphers, and we believe that the number is increasing. We are constantly receiving from such encouragement and commendation for the advance in the character of THE TELEGRAPHER, which they are quick to notice. They do not complain of the space devoted to scientific and practical telegraphic instruction and in-

formation, but the contrary. Such telegraphers are valuable to any telegraph company or line, and they are seldom in want of situations. In the good time coming they will, we firmly believe, command better positions and more adequate compensation than they now do. At all events, there is no danger of any telegrapher being too well informed in his profession or business, and, as a rule, those who are properly qualified and disposed to progress theoretically and practically have the preference for the better telegraphic positions.

It is worth while for those who are just entering upon a telegraphic career to consider the different classes and characteristics which we have hastily sketched, and decide which is most congenial, and most profitable for him or her to emulate. Aside from all other considerations the satisfaction of knowing that you are seeking to acquire the knowledge and information which shall enable you to rank among the better informed and more worthy portions of the telegraphic fraternity, should be sufficient to induce you to choose the better part. There is, undoubtedly, a brilliant future to telegraphy. While it cannot properly be considered as in its infancy, it is unquestionably destined to a much greater development than it has yet attained; and if it is worth adopting or following at all, it is worth excelling in. The young telegraphers of today, occupying however lowly and subordinate positions, are necessarily the leaders and masters of the future. The rewards and triumphs as well as the toil and study are to be theirs, and those who would win must labor for the prizes, and be content, to some extent, to sacrifice present ease and indulgence to future success. Nothing in this world worth having is attainable without labor and sacrifice, and this is eminently true as regards telegraphy.

THE TELEGRAPHER has a higher and nobler purpose than mere temporary gratification or amusement of its readers. It is to elevate the standard of electrical and telegraphic knowledge and proficiency, and, while it seeks to advance the welfare and improve the condition of the fraternity as a whole, and to secure for them proper consideration and just treatment from employers and the public, it desires to make them capable of securing their own advancement, and, by becoming properly qualified and instructed, more powerful and important as a body. Knowledge is power, and it is the lever which will elevate telegraphers to their proper position and importance.

Presentation to Mr. S. C. Rice of Albany, New York.

THE *Albany Evening Journal* gives the following account of a presentation to Mr. S. C. Rice, of the Albany, N. Y., Western Union Telegraph office, which will gratify his numerous telegraphic acquaintances and friends, as an evidence of the deserved esteem and regard in which he is held by his friends and associates in the National Guard:

Appreciating the valuable services of Seymour C. Rice, who for a number of years has filled the position of Secretary for Washington Continentals Company B, and wishing to make some expression of their regard for him as a faithful officer, they, at a regular meeting held last evening, presented him with an elegant testimonial. The gift consisted of a massive gold cross surmounted with an unique raised laurel wreath, and in the centre an enamelled monogram, "W. C. B." The reverse bears the inscription: "Presented to Seymour C. Rice by the members of Washington Continentals Co. B, 10th Regiment N. G. S. N. Y., in appreciation of valuable services rendered as Secretary." Major Davis made the presentation speech in behalf of the Company, to which Mr. Rice, although taken completely by surprise, responded in a very graceful and feeling manner.

Another Atlantic Telegraph Cable Interruption.

ANOTHER of the Anglo-American telegraph cables—which was laid in 1866—has been broken. Fortunately, the fault this time is near the Irish Coast, and in comparatively shallow water, so that there will be but little difficulty in raising and repairing it. It furnishes another illustration, if such were needed of the insecurity of such property, and the necessity of what

may, perhaps, be considered high charges for ocean telegraph service. The cause of this interruption is not, of course, as yet known, and cannot be ascertained until the cable is raised and examined.

There will be no material interruption to cable communication, as the cables which are yet intact will suffice to transmit promptly the business at present offering, and the broken cable will undoubtedly soon be repaired and again in active service.

For Our Next Issue.

THE TELEGRAPHER for April 25 will contain another of the series of articles on the *Elementary Principles of Electrical Measurements*, by Mr. F. L. POPE, in addition to much other interesting and valuable matter. Nothing ever published in this paper has met with a more appreciative reception than these articles, which contain a large amount of information that every telegrapher will find useful and valuable in his every day experience with telegraph operation and management.

We feel considerable pride in the constant improvement which is taking place in THE TELEGRAPHER, and gratified that this improvement is so generally recognized by those best qualified to give an intelligent opinion in regard to it.

The American Fire Alarm Telegraph.

Messrs. GAMEWELL & Co. have just completed and put in successful operation the Fire Alarm Telegraph for Halifax, Nova Scotia. They have also recently closed contracts with the city of Nashville, Tenn., and Somerville, Mass., for the construction of Fire Alarm Telegraphs, and have several other important contracts nearly completed. This company has the only complete and effective municipal telegraph system, and by their liberality and just and honorable dealings have secured the favor of all with whom they have had dealings, and deserve the marked success which has been obtained by them.

A New Firm of Patent Solicitors.

THE eard of Messrs. RICHARDS & HALE, Patent Solicitors, of Washington, D. C., will be found in our advertising columns.

Mr. HALE has recently resigned his position as an assistant examiner in the Patent office, where he was specially entrusted with electrical and telegraphic inventions, and is thoroughly familiar with the practice, and those who may entrust their patent business with this firm will have the advantage of the valuable experience gained through his recent connection with the Patent Office. This firm will also attend to applications for foreign patents.

Personals.

Mr. ED. B. LERNED has resigned his position with the Pennsylvania Railroad, at Tullytown, Pa., and gone to his home at Lockport, Ill., to recruit his health.

Mr. J. H. WOODRUM, operator and agent O. and C. R. R. at Comstocks, Oregon, having resigned to go into the drug business at Portland, Oregon, Mr. J. D. BODLEY has been appointed in his place.

Mr. GEO. F. CRAW, operator and agent O. and C. R. R. at Jefferson, Oregon, has resigned, and started for the East by steamer.

Mr. S. T. JOHNSON has been appointed to fill the position at Jefferson, Oregon, on the O. and C. R. R., vacant through resignation of Mr. GEO. F. CRAW.

Mr. RAY FITCH, formerly of the Pittsburgh, Pa., Pacific and Atlantic office, has accepted a situation with the Western Union Company at Oil City, Pa.

Mr. O. L. PERRY has been appointed manager of Canton City, Ohio, W. U. office. He has been manager of Canton R. R. and W. U. office together for about six years past, and recently the W. U. city office has been opened and he now assumes control of it. He is a first class man; steady, reliable, and a gentleman in every respect. He has the best wishes of his numerous friends in his new position.

Mr. ROBERT K. HAINES has been appointed night operator, Canton R. R. office.

Mr. M. E. BOOTH has been transferred from night manager, Alliance, Ohio, W. U. office to day manager, Canton R. R. office.

Mr. IRA BELNAP, late night operator Canton R. R. office, has for the present withdrawn from the service. Mr. BELNAP is an old operator, and a good, steady man. He takes with him the best wishes of his numerous friends.

The Telegraph.

By Cable.

THE 1866 ATLANTIC TELEGRAPH CABLE INTERRUPTED.

LONDON, April 14.—During a terrific hurricane yesterday off the southwest coast of Ireland, the 1866 Atlantic cable ceased working. The fault is not yet precisely localized, but it reported to be about twenty-five miles from Valencia, and, consequently, in shallow water. As there are still two cables in good working order, messages will not be delayed to any appreciable extent. The land lines between Valencia and London were interrupted yesterday for a short time in consequence of a severe storm.

Extension of the Southern and Atlantic Telegraph Lines.

ON the 7th instant the wires of the Southern and Atlantic Telegraph Co. were completed to Mobile, Alabama. This extension was made under great difficulties—the work being interrupted and delayed by floods and freshets. After the line was completed to Mobile, communication was interrupted for several days by a very extensive and disastrous freshet which inflicted much damage upon all telegraph lines in that section. Upon the 11th instant, however, by great exertion, the lines were repaired and the office opened for business, and is now in successful operation.

This is a most important extension of the lines of this company, which will be continued to New Orleans, La., the present objective point, which it is intended to reach during the present season.

Change in the San Francisco (Cal.) W. U. Office.

JAMES S. URQUIART, who has been in the employ of the Western Union Telegraph Company for about fifteen years, and who for a long time has been manager of the office here, has resigned his position. He is widely and favorably known in this city. John R. Yountz, one of the oldest and most experienced operators on the coast, takes his place.—*San Francisco Bulletin*, April 2d.

Foreign Telegraphic Notes.

THE report of the Direct United States Cable Company (Limited), to be submitted on the 31st inst., shows that 1,536 nautical miles of the cable have been manufactured, and that landing places in Newfoundland, Nova Scotia, and New Hampshire in the United States, have been selected, as also a suitable site in Ireland for the shore end. It is added that the new cable steamer, Faraday, built to the order of the contractors, of 5,000 tons burden, will be moored off Messrs. Siemens's works at Woolwich for the reception of the cable on the 15th of April next. The subscribed capital of the company is £1,300,000, of which £1,056,521 is paid up.

As some misapprehension seems to prevail with reference to the declaration of an interim dividend of but 1 1/2 per cent. for the first quarter upon Anglo-American stock, it may be worth while to point out that this interim payment has been made in response to the unanimous expressed wish of the shareholders at the last annual meeting that quarterly dividends should be paid by way of interest, leaving the balance of profits to be divided at the end of the financial year. We understand that the Board have decided to hold half yearly meetings, thus responding still further to the wishes of the proprietors.

An interim dividend has been declared by the Globe Telegraph and Trust Company of 3s. per share on the preference shares for the quarter ending the 18th of April, 1874, and of 5s. per share on the ordinary shares, being at the rate of 5 per cent. per annum for the six months ending the same date.

The Directors of the Eastern Telegraph Company have announced the usual interim dividend of 2s. 6d. per share for the quarter ended the 30th of December.

Mr. Thompson, Superintendent of the Indian telegraph lines, in a letter in reference to compound words in Indian telegrams, says: "It is not desired to interfere with the sender's choice of words further than to check a practice, which has become general, of joining together syllables and words having no legitimate connection, or introducing long foreign words into English messages with the object of evading payment of the full charge."

The Dominica and Martinique Cable is repaired, and is now open to the public.

Telegraphic and Electrical Brevities.

THE United States ship Tuscarora left Honolulu March 19th, to continue the soundings for the Pacific Telegraph Cable.

H. R. MYERS, of Chicago, was found dead in his bed at the Central Hotel, in that city, yesterday morning. Mr. Myers was formerly manager of the Pacific and Atlantic Telegraph Company at Baltimore, and afterwards held the same position in Chicago, until the recent absorption of that company. For some time past he had been employed as a night operator in the office of the latter company.

Galvanometrical Measurement of the Resistance of Insulators

At the BROOKS INSULATOR WORKS, Philadelphia, April 9th, 1874.

Constant of Galvanometer 18,000 degrees through 1,000,000 units, with 100 cells Callaux.

Description and Number of Insulators.	Date of Exposure.	Deflection per Insulator.	Resistance in Siemens Units.	Date of First Measurement in Rain.	Resistance in Siemens Units.
10 Porcelain (French Administration Standard)	Mar. 1, 1868	30	600,000,000	Apr. 7, 1868	No deflection.
10 Western Union Glass, with painted brackets.	" "	1400	12,800,000	" "	83,000,000
10 West. Union new style (de wire at top).....	" " 1872	1200	15,000,000	Mar. 10, 1872	116,000,000
20 Kenosha on Brackets..	Nov. 1, 1872	1500	12,000,000	Nov. 6, 1872	2,300,000,000
10 Brooks in cross arm...	Mar. 1, 1868	1	18,000,000,000	Apr. 7, 1868	No deflection.

The foregoing table gives the resistance of the insulators when first exposed, and also extent to which their insulating properties have been reduced by exposure.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

APRIL.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
9.....	77% 78 1/2	.....	58 58 1/2
10.....	77% 78 1/2	.....	58 58 1/2
11.....	76% 78	.....	.....
13.....	76% 77%	.....	58 58
14.....	76% 78 1/2	17 17	57 57 1/2
15.....	75 1/2% 77%	16 16	58 1/2%

New Patents.

63 OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ending March 10, 1874, and bearing that date.

148,289.—APPARATUS FOR FILING FUSES BY ELECTRICITY.—Moses G. Farmer, Salem, Mass. Application filed June 21, 1873.

Upon a suitable base are two keys, one single and one double, and a galvanometer, so arranged that when, by proper connecting wires, a feeble current is completed through the fuse it will be shown by the galvanometer when the double key is closed; but when the other key is closed at the same time the galvanometer coil is cut out, and the direct current thereby sufficiently increased in intensity to fire the fuse.

The combination of the double key C, single key D, galvanometer G, and their connections, in the manner and for the purpose as set forth.

148,403.—ELECTRIC GAS LIGHTER.—William W. Batchelder, New York, N. Y. Application filed June 27, 1873.

The lower plate of a portable electrophorus is pulled down by a pivoted thumb lever, which is held by a spring against the edge of the upper or fixed plate. On applying the thumb to the lever its contact with the upper plate is broken an instant before the lower plate is withdrawn.

1. In an electric torch, substantially such as herein described, a thumb lever or trigger, pivoted to the movable section of an electric generator, with one end arranged to cross the junction

formed by the electric generating sections when in contact, for the purpose described.

2. The combination, in an electric torch, of the making and breaking lever J, with the fixed and movable sections A B of the electric generator, and a flexible metallic connection or spring, I, connecting said lever with the gas receiving and diffusing chamber G, substantially as described.

148,338.—ELECTRIC FUSE.—Thomas Varney, San Francisco, Cal. Application filed November 15, 1873.

An electric fuse composed of a single shell containing the requisite fulminate or detonating powder, the electro-sensitive powder, and the ends of the conducting wires, all in proper contact, and secured therein by sulphur, or its equivalent, substantially in the manner and for the purpose set forth.

THE RAILROAD GAZETTE.

The Catechism of the Locomotive (which is now being published weekly) in the *Railroad Gazette* of April 18, will contain engravings and descriptions of the Steam Whistle, Throttle Valve and Grates, and accurate engravings made to a scale of 1-8 in. equal 1 ft. of an 8-wheeled Locomotive by the Grant Works; 8-wheeled, 10-wheeled and Mogul Locomotives by the Baldwin Works. Single copies, 10 cents; \$4 a year; \$2 f. r. six months.

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WM. BEALE HALE,
Late First Assistant Examiner of
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EXCELSIOR TELEGRAPH APPARATUS

for Students and Amateurs.

The custom introduced by us of making Agents of managers and operators, and sharing the profits from the sales of these Instruments with them, has also assisted in increasing our sales to such an extent that we have been compelled to enlarge our facilities for their manufacture.

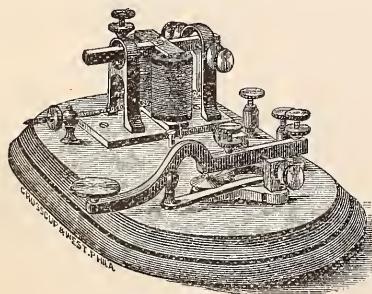
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Instrument with Office Outfit..... 7 50
Two Instruments and Outfits..... 14 50

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FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.
1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D..... \$12 50
If money be sent in advance by registered letter..... 12 00
Instruments without Battery..... 11 50
Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"

"History of America," "Civil War in America;" Member

of many Scientific and Learned Societies of Europe

and America; Commander of the Order of Dan-

nebrog, Denmark; Order of St. Olaf,

Norway, and of the Sword Order,

Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ørsted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

THE "SNAPPER."

Price, 30 cents.



How the Boys "tumble" to it!

READ THE FOLLOWING:

ST. LOUIS, March 24.

R. W. POPE.

DEAR SIR—Enclosed please find \$1.20, for which please send four of your "Snapper" Sounders to the following addresses:

- E. A. ALLEN, W. U. Telegraph office,
- H. J. FOREMAN, W. U. Telegraph office,
- W. J. FOY, W. U. Telegraph office,
- Ed. A. KEENE, Jr., W. U. Telegraph office.

Your little Sounder has created quite an excitement among the boys here.

Later—Still they come. Send one more to the following address: MARC GAUTIER, W. U. Telegraph office. ED.

P. S.—Another County heard from.—Send one more to CHAS. E. BURROWS, W. U. office. The total inclosed for six Sounders, \$1.80.

EDDYVILLE, IOWA, March 21.

DEAR SIR—Please find enclosed 60 cents for two more of your "Snapper" Sounders. If you get this before filling order of the 20th, please enclose the four in paper box. Think will send for couple more in a week. They make more fun for their price than anything I ever saw. Please hurry them along. Can hardly wait. ED. LEGGETT.

ED. LEGGETT.

Manager W. U. office.

DELHI MILLS, MICH., March 24.

DEAR SIR—Please send me three more of the "Snappers." Best thing out. Boys all like them. Please find enclosed 90 cents. Respectfully,

H. HALL.

Sent, post paid, for 30 cents, or six for \$1.50. Purchasers in the British Provinces will please remit 5c. for additional postage.

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This instrument is in some respects similar to the "SNAPPER SOUNDER," but differs from that device very materially in the matter of form, finish and CONSEQUENT DURABILITY. The base is composed of the best metal, highly polished, the Spring being Nickel Plated, and capable of producing a clear and pleasant sound. All who have used this instrument pronounce it to be par excellence. Sent to any address, post paid, on receipt of 50 cents.

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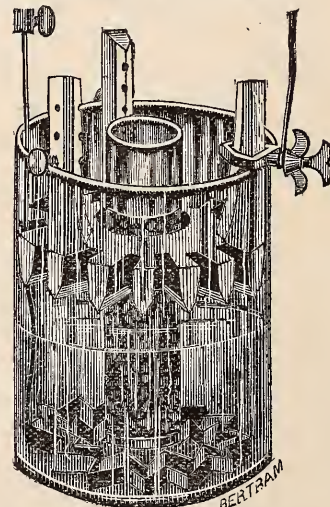
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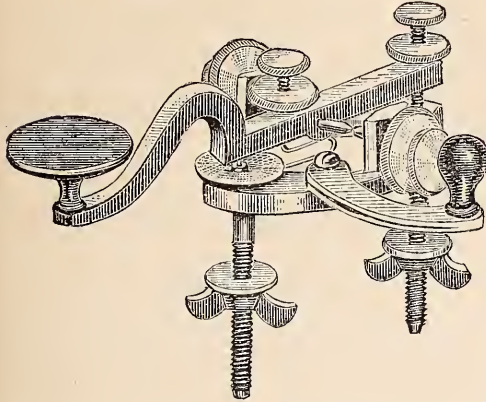
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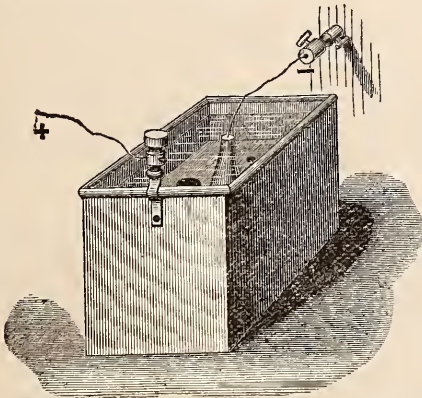
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Does not keep line closed by binding against the anvil.
Will not jar open.
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The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

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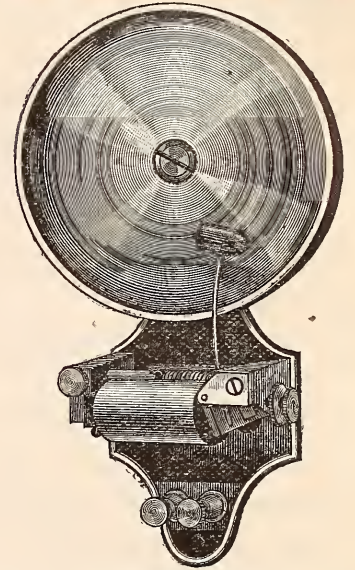
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These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OR

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

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Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

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AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

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has met with the universal approbation and commendation of the

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AND THE

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NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

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RELIABILITY and

ECONOMY

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ABSOLUTELY PERFECT!

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CANNOT EASILY BE ESTIMATED,

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We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

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FOR
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Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. (Considering the wide range of its capacity, it is cheaper than any other instruments.)

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
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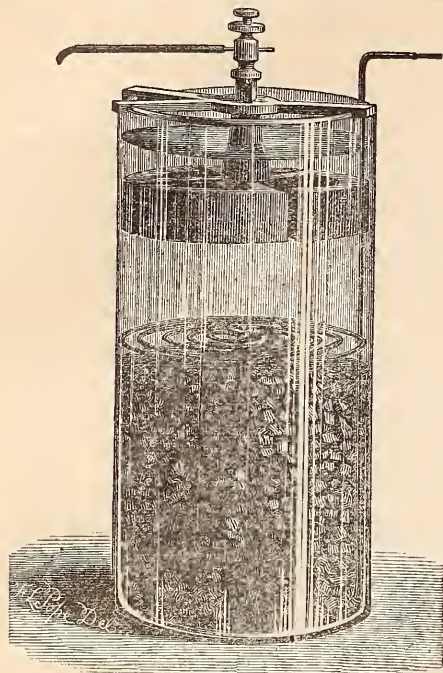
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CELEBRATED HELICES
WHICH ARE OF
Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionably stronger magnet, while the resistance will be the same.

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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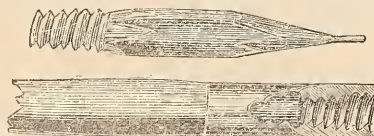
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This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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Five years' operation have proved its merits.

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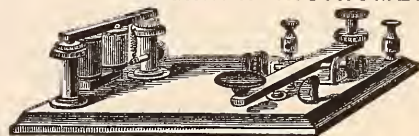
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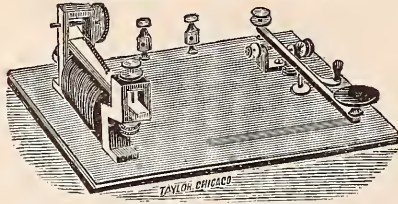
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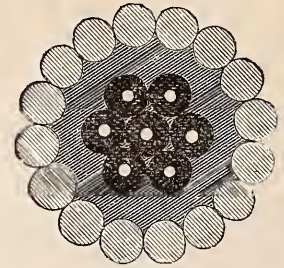
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A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, APRIL 25, 1874.

VOL. X. WHOLE No. 406.

Original Article.

The Elementary Principles of Electrical Measurement.

By F. L. POPE.

(Continued from page 67.)

In some of the tangent galvanometers more recently constructed in Europe, and also in those made for the Western Union Telegraph Company by Mr. Phelps, one half of the scale of the instrument is divided into true degrees, and the other half into spaces proportional to the tangents of the degrees. Inasmuch as the strength of the respective currents by which two different deflections are produced are in proportion to the tangents of those deflections, if we read the indications from a scale divided into degrees, we must reduce these degrees to tangents by means of a table of tangents. Before proceeding to make any calculation having reference to the strength of currents, and where the utmost accuracy attainable is required, this is probably the best way; but where one half the scale is divided into spaces corresponding to the tangents of the degrees, the numbers may be read off directly from the indication of the opposite end of the needle, by which operations are greatly facilitated.

Many of the more recent galvanometers are provided with a section of mirror let into the dial plate of the instrument, beneath the needle and close alongside the scale, by means of which the inaccuracy known as "parallax error," or that arising from observing the pointer obliquely, is corrected. When, in looking at the indication of the pointer upon the scale, we place the eye in such a position that the reflected image of the pointer in the mirror is hidden by the pointer itself, we know that the line of sight must necessarily be perpendicular to the scale.

It is scarcely necessary to add, that in using the instrument care should be taken that it is properly leveled, so that the needle will swing perfectly free, and that the extremities of the pointer precisely coincide with the zero points.

The Sine Galvanometer.

A galvanometer so arranged as to admit of its coils being turned in a horizontal plane around the axis of suspension of its needle, is called a *sine galvanometer*. Such an instrument is sometimes arranged with a single needle, and sometimes with an astatic system of two needles, as heretofore explained. If, therefore, after the needle has been to a certain angle by the influence of a current passing through the coils, the coils themselves be turned in the same direction, so as to follow the needle, as it were, the latter will be still further deflected from the meridian, but always through a smaller distance than that traversed by the coil when turned after it. Hence a point may be found by trial, at which the coil and the needle will again coincide with each other and become parallel. This is owing to the fact that the force with which the coil acts upon the needle is constant, provided the current remains uniform, while the tendency of the needle to return to the magnetic meridian becomes greater and greater as it is more and more removed from it, and when these opposing forces exactly balance each other the needle will again be in a position parallel to the coils. The strength of current by which the deflection of the needle is produced will then be directly proportional to the sine of the angle through which the coils have been moved to bring them parallel with the needle.

The results obtained by the sine galvanometer are entirely independent of the size or length of the needle, shape of the coils, etc., and, with careful management, are exceedingly accurate. Great care should be taken to have the instrument properly adjusted before commencing operations. It should be placed on a firm support, and the screw to which the fibre is attached turned until the latter is shortened sufficiently to permit the needle to swing freely. The instrument should be placed as nearly as possible in the magnetic meridian, with the needle directly over the zero points of the scale. It should then be adjusted to an exact horizontal plane by means of the levelling screw upon which it is supported, which may be known by the metal wire which passes through the scale to connect the two needles being exactly in the centre of the opening provided for it.

The sine galvanometer may be made very sensitive, especially when provided with an astatic system of needles. It is principally employed in the measurement of very feeble currents, such as the leakage from a small number of insulators, and other similar purposes; but, during later years, it has been, in a great measure, superseded by the more sensitive and more convenient reflecting galvanometer.

The Differential Galvanometer.

Any of the different forms of galvanometer which have been described may be constructed as a *differential galvanometer*, simply by winding the coils with two insulated conductors side by side, so arranged that each will make precisely the same number of convolutions around the needle. The ends of each conductor are brought to separate terminals upon the base, so that two different currents may be passed through the two conductors at the same time, or they may readily be connected so as to form in effect but a single continuous conductor. The instruments of Gaugain and of Farmer, illustrated in a preceding article, are arranged in this way. Such an instrument is very convenient in comparing different currents or different resistances. Its application in ordinary electrical measurements will be explained hereafter.

Adaptation of Galvanometers to Different Conditions.

A galvanometer for any particular purpose must always be selected with reference to the total resistance of the circuit in which it is intended to be used. In a circuit of very small resistance the greatest deflection will be obtained by an instrument having but a few turns of very thick wire, or in some cases even a single wire or band passing but once around the needle. On the other hand, a circuit of very great resistance will almost necessarily have a very weak current, and the best arrangement in this case would be to have a coil of very fine wire, with many thousand convolutions around the needle. For different purposes, coils of a resistance intermediate between these two extremes are frequently found useful. Very often the same instrument is provided with a coil of very small resistance and another of very great resistance wound on the same bobbin, either of which may be used as circumstances require, and some instruments even have four or five coils thus arranged, and of varying resistances, as, for instance, the Bradley tangent galvanometer illustrated in a former article.

Mr. Jenkin very properly terms these two classes of instruments "long coil" and "short coil" galvanometers, and in relation thereto remarks, that "in some writings these two classes of instruments are spoken of as adapted to two different classes of currents, instead of to two different classes of circuits. The instrument with numerous turns of fine wire is said to indicate *intensity* currents, and the other class to indicate *quantity* currents. These two old names survive, although the fallacious theory, which assumed that there were two kinds of currents, is extinct; the term 'intensity galvanometer' was used to signify an instrument with thousands of turns of thin wire in its coil, and 'quantity galvanometer' an instrument with a few turns of thick wire."

"The student must clearly understand that equal deflections on the same galvanometer always indicate equal currents. These currents may be flowing through very different circuits, and any given change may produce very different effects in the two circuits; but so long as the currents produce the same deflection in the same or equal galvanometers, the currents are equal though the circuits may be very different."*

The greatest effect in any given circuit is always obtained by a galvanometer, the coils of which are equal in resistance to the remainder of that circuit, including the resistance of the battery itself.

(To be continued.)

The Theory of Magnetic Forces.

This forms the subject of a memoir recently communicated to the Imperial Academy of Sciences, Vienna, by M. Stefan. The work consists of three parts.

In the first, "On Calculation of the Magnetic Forces of Electric Currents," it is shown that the equivalence between forces obtained from magnets and those from systems of electric currents is complete, not only (as is known) in the exterior, but also in the interior space, and that the action of a magnet on a point lying beyond its elements must be distinguished from its action on one found within these. A simple rule is given for calculation of electro-magnetic forces; and it is specially remarked that the interior of a ball, round which currents circulate in parallel circles, affords a homogeneous magnetic field; that the same property belongs also to an ellipsoid; and such systems of currents afford galvanometer and magnetisation spirals of constant force.

In the second part, "On the action of a Magnet on an Interior Point," this problem, already touched upon

in the first part, is handled more fully. It is shown that the action of a magnet on an interior point is not perfectly determined by the magnetic potential; that, besides the forces given by this potential, there are others operative, various in direction and strength, according as the point affected is within or without a molecule of the magnet. These forces are dependent on the form and position of the molecule, and of such a nature that the sum of their work, in a finite path, is nil. Only where the magnetism of the molecules arises from electric currents, the latter is generally not the case; and the principle of conservation of work requires the appearance of induction currents.

The third part has for subject the "Theory of Magnetic Induction." The principle found in the second part as to the action of a magnet on a point in the interior of one of its molecules, serves here as a basis. This principle being assumed, the general equations of the theory of magnetic induction, and the theory (identical with this) of dielectric polarization can be directly written; and, with the aid of some principles ascertained in the first part, certain problems as to the magnetization of a ball, an ellipsoid, a ring, can be solved without further calculation. Several series of experiments are then discussed, from which it appears that all kinds of iron and steel permit of the same maximum of magnetization, that the resistance of iron and nickel to magnetization is at first very great, then decreases to a minimum value, which is reached when the induced magnetic moment is become a third of its maximum; and thenceforth the resistance again increases to an infinite extent. From these data, and some general considerations, a formula is deduced for the magnetic molecular force, which is found to agree well with experience.

Novel Application of Electricity.

A novel adaptation of electricity has just been applied to several of the carriages of the London General Omnibus Company, which appears destined to add considerably to the profits of the shareholders, by providing an efficient check against the numerous petty frauds on the part of the conductors, which for some time past have seriously affected the revenue from this and other public conveyances. By a very simple piece of mechanism placed under each seat of the passengers a tell-tale or dial is made to register the number of passengers entering the carriage and the distance which each travels. There is nothing of the mechanical portion of the arrangement visible to the passenger, and the dial is so placed as to be entirely free from any chance of tampering with on the part of the conductors, while the register made is so complete and accurate that no chance of dispute can possibly arise. The electric apparatus referred to is one of the numerous inventions for which the public are indebted to Sir Charles Wheatstone, and which, together with several other of the inventions of that distinguished electrician, have been purchased by the Electric Power Company. So much importance is attached to the value of this apparatus as a check on conductors of omnibuses that already a considerable advance has taken place in the shares of the Omnibus Company, and a further extension of the system to omnibuses and tramways appears to be a boon to the shareholders of these companies.

Pacific Ocean Deep Sea Soundings.

At a recent meeting of the California Academy of Sciences, Professor Davidson announced some of the results of the soundings made by Captain George T. Belknap, of the United States steamer Tuscarora, during last year, with reference to the projected laying of a telegraphic cable from this coast to Japan. This work had accomplished a remarkable development of the depths of the Pacific Ocean which had no parallel in the plateaus of the Atlantic. The Tuscarora first started in her line of soundings from the entrance to the Straits of Fuca, across that portion of the North Pacific designated as the Gulf of Alaska, toward the Asiatic coast. After leaving the entrance to the straits the bottom slopes gradually to a depth of 100 fathoms, and then a sudden descent occurs which reaches to 1,400 fathoms at a distance of 150 miles from the coast. The temperature of the water at the greatest depth on this line of survey was 34 degrees.

Commander Belknap then returned, prosecuting off and on soundings all along the coast to the entrance of San Francisco Bay. This work determined the fact that the sudden descent at the bottom of the Pacific to a great depth is continuous down the entire coast, varying from twenty to seventy miles out. In the latitude of San Francisco Bay the great bench is reached a short distance off the Farallones, where the bottom suddenly descends to a depth of two miles. Off Cape Foulweather the bottom descends precipitately from 400 fathoms to a depth of 1,500 fathoms, and then the plateau continues westward for hundreds of miles and comparatively as level as a billiard table. Off Cape Mendocino, where shoals have been erroneously supposed to exist from the seaward jutting of the moun-

* Electricity and Magnetism, page 190.

tains, a depth of 2,200 fathoms is reached eighty miles from the shore. Thirty miles off the Golden Gate the bottom is reached at 100 fathoms, at 55 miles it has descended to 1,700 fathoms, and 100 miles out the enormous depth of 2,548 fathoms has been measured without reaching bottom.

A Bit of Advice to Correspondents.

THERE are a few things that we would like to impress upon the minds of those whose fortune, or misfortune, necessitates sending their correspondence to a newspaper. Here they are:

Write plainly. Not to do so is to make an item almost valueless, and sometimes worse than useless.

If you write a "back hand," learn to do it with the left hand, that the compositor may not have to stretch his neck to the left to a dangerous extent to get the run of a word.

Don't underline every adjective in a sentence, after the style of a lawyer's brief.

If you have ever studied punctuation at all, punctuate; but, if you have not, let it slide.

If you have occasion to make a capital J, write below and not on the line.

If John Smith or William McFadden have purchased a piece of property of Hezekiah Hobbetop, for \$1,000, say so if you desire to see the notice in print. There is no occasion to say: "Our highly respected and honorable citizen, John Smith, who for the last ten years has been selling milk at ten cents a quart, thereby realizing a munificent profit, has purchased from his neighbor, Mr. Hezekiah Hobbetop, a most estimable citizen, and honorable vender of garden sass and sich, that beautifully located piece of property known as "Fools' Folly Plot," and in that most salubrious location intends erecting a house thereon. Self-praise is no recommendation, neither does it pay the printer, but it doth disgust him.

Dot your i's, cross your t's, point your u's, and make them distinct from the rounded n.

Use ink. Lead pencil writing overstrains the eye of the compositor when deciphering it, and also causes him to indulge in "cuss words."

Crowd as many facts into as few words as possible, so that your neighbor can find room to advertise his tortoise shell cat, which strayed from his bed and board.

Be sure to spell names correctly. A man wants his name given rightly or not at all.

Never write Sabbath for Sunday.—Yonkers Gazette.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 55, 56 AND 57, UP TO AND INCLUDING APRIL 13, 1874.

- 17, 19, 22, 27, 31, 33, 51, 55, 69, 84, 98, 100, 121, 136, 138, 139, 141, 142, 144, 153, 154, 156, 158, 160, 164, 169, 171, 181, 182, 185, 186, 187, 206, 227, 230, 232, 237, 238, 242, 246, 248, 252, 258, 271, 273, 280, 288, 294, 303, 316, 319, 323, 328, 341, 344, 347, 357, 360, 362, 364, 366, 371, 376, 379, 382, 394, 398, 411, 412, 418, 428, 429, 430, 431, 434, 441, 451, 453, 455, 457, 481, 482, 490, 495, 497, 499, 500, 503, 504, 505, 506, 507, 508, 525, 527, 555, 556, 557, 555, 566, 573, 575, 584, 586, 597, 605, 618, 626, 648, 649, 655, 670, 671, 690, 692, 694, 695, 697, 701, 703, 705, 710, 712, 717, 722, 723, 724, 728, 730, 733, 737, 750, 751, 756, 758, 766, 780, 781, 782, 783, 785, 786, 790, 791, 802, 804, 809, 812, 823, 825, 831, 836, 838, 841, 842, 855, 869, 871, 874, 875, 876, 897, 899, 904, 906, 908, 916, 926, 930, 931, 932, 934, 944, 949, 954, 956, 957, 959, 960, 963, 964, 979, 980, 1000, 1002, 1009, 1014, 1016, 1026, 1030, 1031, 1033, 1034, 1038, 1041, 1046, 1050, 1057, 1063, 1069, 1071, 1072, 1080, 1099, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1121, 1122, 1123, 1125, 1131, 1134, 1135, 1136, 1139, 1141, 1153, 1169, 1182, 1190, 1191, 1193, 1194, 1195, 1198, 1207, 1214, 1217, 1221, 1226, 1227, 1234, 1235, 1248, 1255, 1256, 1268, 1269, 1273, 1274, 1275, 1279, 1281, 1283, 1284, 1285, 1286, 1290, 1292, 1295, 1339, 1340, 1342, 1344, 1346, 1348, 1349, 1350, 1351, 1352, 1366, 1371, 1673, 1398, 1400, 1405, 1406, 1415, 1421, 1427, 1428, 1431, 1432, 1433, 1444, 1450, 1457, 1458, 1465, 1469, 1470, 1471, 1474, 1475, 1476, 1481, 1488, 1490, 1495, 1496, 1497, 1498, 1502, 1503, 1504, 1505, 1513, 1514, 1515, 1516, 1519, 1528, 1529, 1530, 1531, 1532, 1537, 1542, 1553, 1556, 1557, 1558, 1559, 1562, 1563, 1570, 1573, 1576, 1582, 1586, 1596, 1597, 1601, 1603, 1604, 1605, 1608, 1609, 1610, 1611, 1612, 1613, 1616, 1625, 1629, 1639, 1641, 1646, 1649, 1650, 1653, 1655, 1657, 1666, 1667, 1669, 1670, 1673, 1676, 1677, 1680, 1681, 1682, 1684, 1687, 1688, 1689, 1690, 1696, 1700, 1701, 1702, 1704, 1707, 1708, 1709, 1710, 1712, 1713, 1715, 1716, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1726, 1727, 1731, 1733, 1737, 1741, 1742, 1743, 1745, 1746, 1747, 1650, 1751, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1765, 1766, 1767, 1768, 1769, 1771, 1772,

- 1773, 1775, 1777, 1778, 1785, 1786, 1788, 1789, 1791, 1802, 1807, 1810, 1814, 1828, 1830, 1837, 1838, 1839, 1840, 1841, 1847, 1854, 1857, 1858, 1859, 1860, 1863, 1864, 1874, 1877, 1888, 1889, 1895, 1896, 1897, 1915, 1916, 1929, 1931, 1938, 1939, 1941, 1942, 1945, 1946, 1947, 1958, 1964, 1969, 1972, 1973, 1974, 1975, 1976, 1985, 1986, 1991, 1992, 1993, 1995, 2004, 2007, 2010, 2012, 2022, 2023, 2024, 2037, 2040, 2041, 2045, 2048, 2053, 2056, 2060, 2061, 2063, 2064, 2066, 2072, 2079, 2081, 2085, 2089, 2092, 2095, 2098, 2105, 2106, 2108, 2110, 2112, 2115, 2128, 2129, 2130, 2132, 2134, 2137, 2139, 2146, 2148, 2150, 2151, 2156, 2157, 2159, 2163, 2168, 2171, 2175, 2176, 2177, 2180, 2182, 2183, 2184, 2185, 2189.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 58, 59 AND 60, UP TO AND INCLUDING APRIL 13, 1874.

- 16, 17, 19, 25, 37, 46, 50, 52, 53, 54, 56, 59, 60, 61, 64, 67, 77, 86, 88, 91, 95, 97, 99, 100, 113, 121, 129, 133, 134, 138, 145, 157, 176, 177, 181, 201, 202, 217, 218, 220, 228, 244, 245, 454, 257, 267, 269, 276, 278, 279, 281, 282, 283, 285, 286, 301, 312, 219, 349, 353, 361, 367, 378, 383, 375, 394, 406, 411, 416, 425, 426, 434, 438, 456, 463, 464, 467, 478, 509, 510, 520, 526, 532, 533, 536, 546, 547, 548, 549, 564, 576, 577, 579, 587, 594, 603, 615, 626, 656, 661, 670, 672, 678, 680, 703, 715, 721, 722, 731, 734, 740, 772, 799, 813, 815, 821, 825, 832, 875, 886, 911, 938, 995, 1001, 1009, 1011, 1013, 1023, 1024, 1039, 1054, 1055, 1061, 1081, 1088, 1090, 1126, 1143, 1144, 1148, 1173, 1175, 1183, 1195, 1198, 1199, 1200, 1208, 1213, 1225, 1245, 1251, 1252, 1259, 1260, 1276, 1296, 1294, 1300, 1306, 1325, 1329, 1353, 1354, 1355, 1356, 1359, 1364, 1365, 1368, 1371, 1376, 1394, 1398, 1402, 1403, 1404, 1407, 1410, 1412, 3440, 1444, 1448, 1451, 1453, 1454, 1455, 1456, 1482, 1506, 1507, 1516, 1517, 1518, 1519, 1522, 1550, 1560, 1568, 1571, 1589, 1590, 1615, 1634, 1635, 1658, 1695, 1728, 1735, 1736, 1742, 1763, 1790, 1809, 1811, 1812, 1817, 1831, 1869, 1874, 1877, 1882, 1894, 1906, 1911, 1913, 1914, 1919, 1932, 1944, 1946, 1947, 1958, 1965, 1970, 1991, 1995, 1999, 2000, 2001, 2006, 2019, 2020, 2021, 2028, 2029, 2030, 2035, 2036, 2044, 2048, 2049, 2050, 2069, 2082, 2086, 2097, 2099, 2103, 2118, 2120, 2129, 2133, 2135, 2164, 2172, 2174, 2178, 2186, 2190, 2194, 2201.

NOS. 53 AND 54.

- 98, 237, 496, 1069, 1256, 1916, 1929, 1941.

MISCELLANEOUS.

- 55.—496, 1917. 56.—1629. 58.—553, 825, 1742, 1874, 1938, 2119, 2130, 2139, 2168, 2175, 2176. 59.—553, 1874, 1938, 2119, 2139.

How the English Government Treats its Female Operators.

A CORRESPONDENT of the English Mechanic, who signs himself "a father of six girls," writes to that journal giving a not very flattering account of the treatment the young ladies receive in the Government Telegraph office in London. He says that the ventilation of the new building in St. Martin's-le-Grand is so bad that it is very difficult to work there in the evening. No place is provided for hats, cloaks, &c., and every one's knife, fork, plate, mug and slippers have to be carried backwards and forwards every day. He adds: "The girls seem to be made to work as hard as possible, and if the slightest mistake is made they are mulcted in one, two or three hours' extra duty, without even a chance being given them of knowing whether they were fairly culpable or not. The company of the men and messenger boys is not only most disagreeable but baneful to a young girl, for the conversation which is allowed to go on unchecked; while as to salary, all sorts of excuses are made to keep them as low as possible. Ex post facto laws are made which make the girls cry shame on the managers; for they are all intended to get more work out of them."

The Pacific Cable.

THE San Diego, Cal., Daily Union of March 21, has the following in regard to the soundings for the proposed Pacific Telegraph Cable, which U. S. steamship Tuscarora is now engaged upon: "Letters were received in this city yesterday from the U. S. steamship Tuscarora, dated at Honolulu, Hawaii, March 5th, conveying the gratifying intelligence of the entire success of the survey between San Diego and the Sandwich Islands. Readers of The Union will remember that when the Tuscarora sailed from this port the hope was expressed by Commander Belknap that soundings would not be developed showing a depth of over three thousand fathoms. It appears that the greatest depth found exceeded his expectations by only fifty-four fathoms, so that the perfect feasibility of this route for

a cable across the Pacific ocean has been established. The Tuscarora was to leave Honolulu in about a week from the date above given to engage in the prosecution of the survey between the Sandwich Islands and Japan. Profiles of the survey between San Diego and Honolulu have been sent to Washington for examination. If the indications of the work as far as it has progressed are to be regarded, little doubt can be entertained that the Southern route will be adopted, and that The Union's prediction that San Diego would be made the American terminus of the Asiatic cable will be realized. From the correspondence referred to we learn that the people of the Sandwich Islands are fully awake to the importance of this great work, and anxious for the early establishment of cable communication. The American Minister Resident states that Mr. Cyrus W. Field has already secured a concession from the Hawaiian Government."

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

What the Objects and Purposes of a Telegraphic Association Should Be.

TO THE EDITOR OF THE TELEGRAPHER.

IN a communication published in THE TELEGRAPHER of March 21st, I submitted to the consideration of its readers and the telegraphic fraternity some views and suggestions in regard to the organization of a telegraphic association. The discussion has continued very actively in the columns of the paper since the communication referred to appeared, and, except in one instance, there has been no indication of any attempt at advancing the object which your correspondents apparently have so much at heart. They all reiterate the necessity that exists that something should and must be done to accomplish the work, but neither of them seem to have any definite idea of how it is to be effected or by whom the movement is to be initiated, or upon what basis an association is to be formed. From the indications so far, it seems to me that the whole matter is likely to terminate, as usual, in mere talk.

To arrive at any definite conclusion in the matter, it is essential that somebody should propose a reasonable and practicable basis for such an organization, and in my previous communication the purpose was intimated of stating my views as to what the purposes of such an organization should be.

Your correspondents very generally and sensibly repudiate the idea that any organization that may be effected shall favor "strikes" as a means of attaining their purposes. Leaving this method—which experience has shown to be about the worst that could be adopted, and which should never be resorted to except in very extreme cases—out of the question, what shall be the means by which any desirable reform is to be effected? This is a most important question, and until it is satisfactorily answered, I do not think any material progress will be made towards effecting an organization.

The idea that any organization is to accomplish at once the desired reforms and improvements, or become powerful and effective, is absurd. It must commence, if at all, in a small way, and as it gradually secures the confidence and coöperation of the fraternity its power and importance will increase.

My idea as to the objects to be accomplished by a telegraphic organization is to establish, in the first place, a standard of ability and proficiency among telegraphers, which shall be recognized both by employers and employes, and which shall secure to the latter their proper positions and compensation. As is well known, there is at present no recognized standard of professional ability, and operators not unfrequently hold positions to which they are by no means entitled, while others are compelled to accept situations and compensation below those justly belonging to them. It should be the purpose of any organization that may be effected to correct this. It can only be done by coöperation between employers and employes, and it should be the object of an association eventually to effect this.

There should be combined with this to make an association immediately useful and attractive a system of mutual brotherhood and relief to members who may temporarily be unemployed or unable to labor. This would need to be carefully guarded in order that the association should not become the victim of drones, frauds and incompetents, with which the fraternity is cursed.

We should not undertake, as some labor organizations do, to forcibly interfere between employers and employes, and establish a scale of compensation which shall apply alike to the good and the bad, the efficient and inefficient among us. Every employe has his proper place and value, and no association which under-

takes forcibly to dictate in this respect can be permanently successful.

We should seek to enrol in our proposed organization as nearly the whole working telegraphic force as possible, so that when it speaks through its proper officers or representatives it shall be understood as giving form and substance to the desires and purposes of the fraternity as expressed by the majority, and any proposition or arrangement which may be agreed upon should be binding upon all.

I will not proceed further in this communication, but if there appears to be a desire for it, will, at a future time, give my views as to the form of such an organization and how it may be effected.

COMMON SENSE.

Value and Importance of The Telegrapher.—An Operator Sold.

BAY CITY, Mich., April 4.

TO THE EDITOR OF THE TELEGRAPHER.

It is now verging on two years since I first subscribed for THE TELEGRAPHER, and if I may presume to pass any opinion as to the present standing of the paper, I would say there is a marked improvement. With many others, I think it is a paper decidedly well adapted to our wants, and indispensable to all of our profession, principally because it is the means afforded us whereby we are at perfect liberty, and feel comfortably at home in discussing all matters telegraphically concerning us, in accordance with our sense of right and wrong. By its weekly visits we are kept well posted regarding all telegraphic enterprises, projects, etc., occurring in all quarters of the globe. It is also invaluable for those of the profession who are tolerably well advanced in electrical science, inasmuch as that they will occasionally find some good, sound, information from the pen of our most learned and experienced electricians. And, again, the many interesting letters occurring week after week in that portion of the paper set apart for correspondents, cannot fail to be of interest to the junior class of operators.

Unfortunately the world does not appear to entertain very encouraging views of the character of operators in general. This, to our sorrow, we are all well aware of. To use a common phrase, we are looked upon as "hard cases;" but it does one good to see occasionally in your columns the productions of those who are not to be denounced as such, but who hold their heads erect and have their hearts in the right place; and it is consoling to know that we are not entirely devoid of good men—men who mean well, and are equally as good as any other man as long as they strive to do that which is right; but I am deviating from the point.

Dear reader, ponder for a moment and see if you don't arrive at the same conclusion as myself, and that is: ought we not to be proud in possessing such a paper as this? or, in other words, how would you like to be without it? Let us one and all encourage the publisher. He spares no pains in making it what he, in his experience, thinks it ought to be. How are we to manifest an appreciation of the same? The least we can do is for each one of us to resolve to procure at least one subscriber in addition to our own subscription. Let us make the resolution binding upon ourselves as a duty we owe to the support of our paper, with which we all ought to be satisfied, and see that no man goes back on his word, also bearing in mind the maxim, "Live and let live."

I will now turn your attention to a somewhat laughable joke practiced on one who is naturally good natured and a whole soul sort of a fellow.

The following conversation occurred between the manager at B. C. office, and an operator working that circuit in repeating office at D. E.

Manager B. C.—"Here's a country chap wants a situation, and wishes me to recommend him to the superintendent. Will you try him and see what he can do?"

Operator D. E.—"Certainly; let him sit down."

Manager B. C.—"All right; try him on the send first." [Here "country" proceeds to manipulate, and sends quite a few messages.]

Operator D. E.—"Think you are pretty good on the send. At present I have no messages, but will try you on report."

He commences very slow and sure, evidently intending not to make "country" nervous, and gives him all the show in the world. Operator writes his best.

Country.—"Can't you send faster?"

Operator D. E. opens up a little.

Country.—"Is that the best you can do? 'Hoop it up.'"

Operator D. E.—"My hand is stiff this morning. But thinks he can make it lively enough for any 'greeny' like him.) "Country" never breaks.

Country.—"Are you one of the best men they have in that of?"

Operator D. E.—(who is somewhat wrathful, but curbs his anger, and modestly exclaims)—"It wouldn't do or me to say!"

Country.—"Do you think I could get a situation in that of?"

Operator D. E.—"I guess so—you appear to be a pretty good operator. Better try." Here "country," who is the regular man on that string in B. C., signs his private "Q."

Operator D. E.—"Holy Moses! I thought you had lots of cheek for a stranger."

It's useless to make any further comment upon the feelings of the poor deluded victim. Suffice it to say that we all know how we would feel ourselves were we to place ourselves in his place. I regret it had not occurred on the first of the month. More anon.

Q.

The Ville du Havre Disaster.

TO THE EDITOR OF THE TELEGRAPHER.

SINCE the announcement of this distressing disaster I have indulged pretty freely in mental speculations in search of a species of preventive of sacrifice of life by shipwreck or accidents like that which destroyed the Ville du Havre.

Why would it not be the correct thing for governments to take up the matter, and give shipowners to understand that they must provide more means of escape from a sinking, or burning, or wrecked ship than a few boats, which, as a rule, are so well fastened to the ship that in an accident equal to that in point, not one of them can be got in the water in time to be of service.

I would suggest making every mattress of rubber, an air tight affair, in order that passengers situated similarly to those who were on the Ville du Havre may have a tangible life preserver at their hauds—one which they can feel a certain amount of confidence in in the event of being obliged to jump or get overboard. Some will say that the concussion of jumping into the water on one of these mattresses would burst the mattress. I think every rubber company in the world will guarantee to manufacture an article which will refute the objection. I am sure that, in addition to the life preserver object of my mattress, the comfort of the passenger will be greater in their ordinary use than while using the orthodox hair (?) or straw, especially in warm latitudes; besides I have doubts whether "specimens of natural history" would take kindly to the rubber.

I would also suggest that as much as may be practicable of the deck work of a ship be made portable; for example, the usual benching should be in sections, and so put together that an ordinary passenger may observe that it is portable and may be taken apart in a moment and made to serve as a buoy in case of shipwreck. The doors of every room on the many ships I have been on board of were hinged "to stay;" now, I propose that all doors be fastened with the ordinary hook hinge, and that they be constructed with a view to securing the utmost buoyancy should they be unhinged and used as a life preserver in the water. I would also require that the roofing of deck houses be constructed so that it may be unshipped if required, and be buoyant in the water. Even the iron pipes used as ventilators, and which are screwed on at the deck, may be constructed so that in an emergency they can be converted into first rate buoys, to which many would be glad to cling. I would have plates with rubber packing alongside of each ventilator to clap on to the two ends of the pipe. Deck chairs might be constructed with an eye to depreciating my mattress and doors!

I have made so many voyages on steamers overladen with passengers, that it is probable I am more disposed to hamper a ship with life preservers than any steamship company or owner can see the necessity for.

This is scarcely a fit subject for a telegraphic journal, unless you admit that I have, perhaps, introduced one in which the whole civilized world is very much interested; and that if from our fraternity should go forth something new and advantageous on the subject, you will find your excuse for publishing the reflections of SA.

On What Shall a Telegraphic Union be Based?

TO THE EDITOR OF THE TELEGRAPHER.

LIKE "In Earnest," I too have been watching the discussion about the proposed Telegraphers' Union, but perhaps I am slower to comprehend what benefit there would be in it for the operators. From all that has been said, I understand that it is to be used to kill off a certain class known as "plugs." Another wants it because he did not receive a merited promotion. Another because he thinks the operators, as a class, are going down hill. In the moral line perhaps it is so; they all seem to smoke on this division, but they are pretty much all married, so it don't make much difference. As for me, I would not feel hurt if I was hit with a box, providing the cigars were inside; but the above would hardly do for a basis to start this Union upon. Still another complaint is that the wages are getting low. That, I admit, is a sound complaint; but what is the Union going to do about it? Can they raise it? Some say we won't allow any but good or

first class operators in the Union; but that won't bring the pay up, or prevent a company from hiring whom they please and putting them where they please; nor will it close up these plug manufactories, and I think there was a time when the best among the operators were wont to "frite gerse," and tried to murder the "Althephet" with as much earnestness as any beginner of these days; so give them a show. I would suggest that, ere we take the elephant we know what we are going to do with him and how to do it. I would not care about forming a Union to turn it into another fizzle, merely because some one was not satisfied with his lot.

Jo.

A Telegraph Pickle Factory.—An Unsatisfactory Ground Wire.

NEW BUFFALO, April 15th.

TO THE EDITOR OF THE TELEGRAPHER.

A FEW evenings since, two men, who had been drinking, stepped to our office window. Looking in, they saw our main battery of nearly a hundred cups. One said to the other, "That's what they run the thing with." "No, it ain't," said his companion; "this is a pickle factory, and those jars are full of pickles." I guess, if he had got hold of any of our pickles it would have pickled him! I was told a few days ago of a line repairer, not over a thousand miles from here, who opened an office at G—. He put the ground wire in a pail, and filled it up with earth. He couldn't see why it would not work. He is the repairer who can read from a cedar pole which is perfectly dry!

F. D.

Another Telegrapher in Earnest.

TO THE EDITOR OF THE TELEGRAPHER.

IN reply to "In Earnest," I will say—if, as you say, your motives are pure—I am with you heart and hand in the cause—a cause which is noble.

I should be pleased to hear direct from you, and the Editor of THE TELEGRAPHER is at liberty to give you my address.

I hope you may prosper, and that ere long we may see the operators one and all united.

SCOTT.

Answers to Correspondents.

S. McNEIDER.—Your subscription expires with No. 422 for July 25, 1874.

ANONYMOUS.—We have often stated in our editorial columns, and you will find the announcement standing at the head of the correspondence columns, where it has been since the first number of THE TELEGRAPHER was issued, that anonymous communications would not receive any attention. The idea is a mean and cowardly one to use the columns of a newspaper to attack a person while concealing, or endeavoring to conceal your own individuality, and cast the responsibility of your lies and abuse upon the paper publishing them. Your effusion followed many predecessors into our waste basket.

Personals.

MR. R. J. HEWETT has been transferred from the Kansas City, Mo., to the Milford, Barton Co., Mo., W. U. Tel. office.

MISS HATTIE PAINE, from the up town branch office, St. Catharine street, Queen's Hall Block, has been appointed to a position in the new office of the Grand Trunk Railway Co. at Montreal, Canada.

MISS ALICE SCOTT from Lachine, BELLA FULLER from Point St. Charles branch office, and M. A. MCGONIGAL have also received appointments to the new office of the G. T. R. at Montreal, Canada.

The operating room and staff of the G. T. R. in the new Montreal office continue under the supervision of Mr. J. R. MCPHREE as Manager, with Mr. J. S. MACKENZIE as Asst. Manager, and from April 1st, Mr. J. S. HENDERSON, formerly of Ogdensburgh, N. Y., as Night Manager. The total number of operators employed in the office is 32.

MR. W. N. EASTABROOK has been appointed Division Operator and Assistant Train Master of the Elmira and Canandaigua Divisions of the Northern Central Railway Company. Headquarters at Elmira, N. Y.

MR. M. S. ROBERTS, our genial friend and old time telegrapher, now the manager of the checking department of the Western Union office, 145 Broadway, New York, has recently been elected as one of the vestrymen of the Episcopal Church at Orange, N. J. Pretty good for Mose! Father, grandfather and vestryman. *Tempus fugit.*

MR. W. H. STEPHENSON has been appointed night manager of W. U. and R. R. telegraph office at Alliance, Ohio. He is a first class operator, a worthy and popular gentleman.

"In the bright lexicon of youth there's no such word as fail."

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, APRIL 25, 1874.

THE TELEGRAPHER:

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THE legal rate of postage on THE TELEGRAPHER, addressed to its regular subscribers, is 20 cents per annum, or 5 cents per quarter, payable in advance. Subscribers who receive their copies by letter carriers will please hand the annual or quarterly postage to the carriers, taking their receipts. If any higher rates are demanded, report the facts to the local Postmaster.

The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Telegraph Lines in Cities.

THE rapid increase of telegraph facilities and, consequently, of telegraph wires in large cities, must, before long, compel some radical change in the construction of such lines. In this city, for instance, in the section below Union Square, there is a perfect labyrinth and net work of such wires. They are suspended on the roofs of buildings in all directions, and the streets are encumbered with huge telegraph poles, some of them carrying 25 to 40 wires. Every day almost adds to the number of these lines, and it is fast becoming a difficult matter to find a place for new wires in certain streets and sections. Other large cities are similarly troubled, though, as yet, not to such an extent as New York.

We have repeatedly, heretofore, referred to this subject, and it has been discussed to some extent in other journals not specially interested in telegraphic matters.

There can be no question but that eventually these wires must go under ground in all large cities, and the sooner some system of subterranean city telegraph is determined upon the better. A year or two ago a company was specially chartered by the New York Legislature for the purpose of establishing a subterranean telegraph system in this city, but we do not learn that it has made any progress towards accomplishing its purpose.

It is a curious fact that nearly twenty years ago the then American Telegraph Co. endeavored to obtain permission from the municipal authorities of New York to run its wires through the city under ground, and it was refused. Had the desired privilege been granted, and that company succeeded in constructing a practicable subterranean telegraph system, it is probable that all or nearly all the lines which have been built since would also have been put under ground even without any legal compulsion. It certainly is no ornament to any city to be crossed in every direction and at all sorts of elevation by telegraph wires; and the poles not only encumber the streets, which should be kept clear of such obstructions, but are unsightly, and are anything but "a thing of beauty," or "a joy for ever," or even temporarily.

With a properly constructed and insulated subterranean telegraph system much of the difficulty experienced now in working these lines would be obviated, and, once established, no one would desire to go back to the present system. It would prove advantageous to

the proprietors of telegraph lines as well as to the city, and it is only a question of time, and, in our opinion, of but a comparatively brief time, when, if not done voluntarily, it will be compulsory upon such proprietors, not only here, but in other large cities, to remove the wires from over the heads to beneath the feet of the public.

Let it be satisfactorily demonstrated that such a system of underground wires has been devised as shall afford proper conductivity, insulation, etc., and be at the same time economical and durable, and its practical introduction may be assured. Who will be the first to provide this?

The Value of Telegraphic Protection Against Conflagrations.

THE exemption enjoyed by New York City from extensive or destructive conflagrations during the present season has been most marked. Other localities have suffered very severely from fires—the most valuable and important part of some towns and cities having been entirely destroyed.

The good fortune of this city, in this respect, has arisen primarily from the protection arising from the extensive systems of telegraphic notification of the inception and location of fires. The municipal fire alarm telegraph system, which is that so generally introduced throughout the country by GAMEWELL & Co., is very complete and efficient. Under the excellent superintendence and management of Mr. C. KINNEY SMITH, the Superintendent, this system is maintained in the most effective condition, and a fire cannot get many minutes' start before the steam fire engines are upon the spot with steam up and ready for work.

In addition to the municipal fire telegraph, the American District Telegraph gives prompt notifications of fires, and has a corps always ready to proceed at once with fire extinguishers to any locality attacked which may be connected with its offices.

Besides this, the Automatic Signal Telegraph Company are doing good service in affording protection by notifying automatically the very commencement of a fire in any building with which it is connected.

No other city in this country is so effectually guarded, telegraphically, from the spread of fires as New York, and the value of such appliances have been very fully demonstrated within the last few months, and the losses by fire, compared with the aggregate amount of property exposed, have been very small indeed.

New York has also that without which even the best telegraphic and electrical arrangements are deprived of much of their value—a most excellent, efficient and well managed fire department. This department was never in such a complete and efficient condition as it is at the present time, and is an exception to the general mismanagement and inefficiency which usually characterize municipal arrangements.

Alliance between the Western Union and American District Telegraph Companies.

IN another column we give the principal provisions of the contract which has just been concluded between the Western Union and the American District Telegraph Companies for the receipt and delivery of business for the former company. This is a very important arrangement and one which will doubtless prove mutually advantageous and profitable, and at the same time bring telegraphic facilities for reaching any part of the country or the world to which telegraphic lines extend to the doors of the residences and places of business of the patrons of the American District Telegraph Company.

The Executive Committee of the Western Union Telegraph Co. have ordered the contract to be immediately carried out, and the W. U. Company will at once open offices in seven of the offices of the District Company, all of which, with the exception of the Central Park office, will be open all night for the reception and delivery of messages.

"The Plug."

THE tearful appeal of our Jersey correspondent for a paper to be started in the interest of "plugs" has met with a prompt response from the porcine metropolis of the West, from whence we have received the first number of a small sheet yecept *The Plug*, the publishers of which have endeavored to give it a charmingly appropriate air of verdancy by printing it on paper of emerald hue. It is conducted by Selden and Mattoon, whom we well know to be wags, but never having "forked a fire" with them, we can't say for certain whether, as plugs, they possess that vast and comprehensive ignorance of telegraphic practice necessary to place them in the front rank of that illustrious brotherhood. The paper is well filled with squibs of both local and general application which are unquestionably cheap at a dime to the victims, if no one else. The classic motto adopted by *The Plug*—"In Pockets put Nickelo"—expresses the object for which journals are usually published, but they are seldom sufficiently and confidently honest to avow it.

Suggestions for Securing the Safety of Passengers in Steamship Disasters.

WE print a communication from an esteemed correspondent suggesting means of securing the safety of passengers on ocean steamers in case of disaster. This is not exactly telegraphic or electrical in its character, but will doubtless be of interest to many telegraphers and persons connected with telegraphs who are not unfrequently represented in the passenger lists of such vessels.

The Telegraph.

Contract for an Alliance and Co-operation between the Western Union and American District Telegraph Company.

Negotiations which have been pending for a considerable time between the Western Union and American District Telegraph Companies for an alliance and co-operation between the two companies, have recently been concluded on terms which are believed to be mutually advantageous.

The contract provides for a general business alliance between the two companies, wherever their systems co-exist. Offices are to be established, operated and maintained upon the principle of mutual interest and good will, the object being to improve public telegraph facilities, and by a division of expenses, either to reduce them, or to furnish at the same cost better service and better facilities and accommodation. In this city the delivery of all messages for points above Chambers, or Worth, or Canal streets (as may be hereafter determined), is to be made by the American District Telegraph Co.

For the present the two contracting companies will unite in maintaining twenty-eight offices, where their joint facilities will be offered to the public. Of these offices five will be open day and night. Six others of the American District Offices will also be kept open and ready for business day and night, for the reception of messages for transmission over the Western Union lines; thus, eleven of the district offices will be open constantly for the reception of Western Union business.

By this alliance and co-operation telegraphic facilities in this city will be greater than are to be found anywhere else, as each of the 2,500 instruments connected with the District Telegraph system in this city practically constitutes a telegraph office, as the lessee can at any time summon to his premises a messenger by whom a despatch can be taken to be transmitted to any point in this country, or elsewhere, where telegraphic connection is made.

The large number of messengers employed by the American District Telegraph Co. will enable them to transmit messages without delay to their destination, while the small area covered by the several districts will insure more rapid delivery than has heretofore been practicable, as no person in the city South of Sixtieth street, will be more than ten minutes distant from a telegraph office, while from 80 to 90 per cent. of the population will be within three minutes of such an office.

The capacity for service of the American District Telegraph system has recently been very fully demonstrated—upon one evening of last week, in addition to its regular business, the company distributed within an hour 10,000 circulars at private houses. It has also during the same week obtained through its messengers and offices 17,382 signatures to a petition for rapid tran-

sit, besides distributing letters, cards, circulars, handbills and newspapers by scores of thousands. Within the twenty-three months during which the system has been in operation, it has proved a great convenience, and it has become an indispensable accommodation to the public.

The Shares of the Gold and Stock Telegraph Co. to be Dealt in at the Stock Exchange.

The shares of the Gold and Stock Telegraph Company have recently been admitted to what is termed the free list of the New York Stock Exchange, and will be quoted and dealt in at the board hereafter. The capital stock amounts to \$2,500,000, each share being \$25 fully paid. The floating debt of the company amounts to \$129,172.74. The gross earnings for the fiscal year ended August 31, 1873, were \$641,977.64; the gross expenses, \$397,084.17; leaving a balance to income account of \$244,893.17. The registry of the company is the Union Trust Company.

The Western Union Executive.

DURING the absence of Prest. Orton in Europe, Mr. A. B. Cornell is acting President of the Western Union Telegraph Company.

The Telegraph Line of the Great Southern Railway.

A NEW railroad is being constructed from Jacksonville, Florida, to Jesup, Georgia, which is called the Great Southern Railway.

Mr. Paul W. Bossart, formerly of this city, and more recently Superintendent of Telegraph of the Buffalo, New York and Philadelphia Railroad, is the Superintendent of Telegraph of the road, and is now engaged in building the line. This road runs through an entirely new country, a distance of 100 miles, which is 120 miles shorter than the present route between the two places.

The telegraph line will be used jointly by the railroad and the Southern and Atlantic Telegraph Co., and will give the latter company an extension into Florida.

The poles for the line are already up for nearly 40 miles, and only waiting for the wire and materials. It is expected that the entire line will be built and in working order by July next.

The Contract Between the Union Pacific R. R. and Western Union Telegraph Cos. to be Terminated.

THE New York Tribune states that on the 20th inst. the Western Union Telegraph Company received formal notice from the Union Pacific of the termination of the contract existing between them. The Union Pacific authorities say that this contract was an onerous one, compelling them to carry large quantities of freight, operatives, etc., to stop trains and the like, and that they reckon its abrogation as equivalent to a saving of at least \$50,000 per year. The result is a decided advantage to the Atlantic and Pacific Telegraph lines in competition for California business. They are expected to construct an independent line from Omaha to Chicago, and thus complete their system of lines between the two oceans. Sharp rivalry between the two companies is said to be impending.

A Proposed Government Telegraph Line on the Texan Frontier.

In the House of Representatives at Washington, D. C., on Monday last, Mr. Giddings, representative from Texas, moved to suspend the rules and pass a bill for the better protection of the frontier settlements of Texas against Indian and Mexican depredations by the construction and maintenance of a line of telegraph from the city of Dennison, Texas, to Fort Sill, Indian Territory, and thence along the northern frontier line of settlements and by the various military posts to Brownsville, and appropriating \$100,000 for that purpose. Agreed to and the bill was passed.

The bill authorizes the Secretary of War to construct and operate a telegraph line, beginning at or near Dennison, Texas; thence to Fort Sill, Indian Territory; thence along the northern frontier line of settlements to Forts Griffin and Concha; thence to Peco River, at or near the mouth of Toyah Creek; thence to Fort Clark, on Los Moras Creek; thence to Fort Duncan, on the Rio Grande; thence down the Rio Grande via Fort McIntosh and Kingdold Barracks to Brownsville, so as to connect with the military posts which are now or may hereafter be established. These posts are from 100 to 200 miles apart, and extend over a distance of 1,500 miles, and, by means of the telegraph line, troops can be concentrated and citizens can be given timely warning of the incursions of Indians and Mexicans. The bill now goes to the Senate.

Foreign Telegraphic Notes.

THE India rubber, Gutta Percha and Telegraph Works Company have received news of the completion of the direct submarine cable between Marseilles and Barcelona, laid from their steamship Dacia. This reopens communication between Spain and the rest of Europe, hitherto interrupted by the destruction of the land lines in the districts affected by the civil war. The line will be opened for traffic shortly.

On Friday, March 27, a new telegraph cable was laid in the Frith of Forth between Granton and Burnt-island, in place of the principal cable, which was destroyed some time ago by a ship riding at anchor running foul of it. The new cable, which is of great strength, was made by the Silvertown Cable Company. The cable was brought to the Frith of Forth by the screw steamer International, and was laid under the direction of Mr. Lunnsden, engineer, Mr. Tansley, chief telegraph engineer for Scotland, and Mr. Lessels, divisional engineer.

The Cuba Submarine Telegraph Company have notified that their cable between Batabano and Santiago de Cuba has been repaired. This reopens telegraphic communication with the whole of the West Indies, and places for the first time Panama in communication with Europe.

The Submarine Cable Trust Company announce that the coupon attached to their certificates for six months' interest at the rate of 6 per cent. per annum, due April 15th inst., will be payable to Messrs. Glyn, Mill & Co. on that day. After providing for the coupons and expenses of the trust, the surplus revenue for the current financial year ending April 15, 1874, would enable the trustees to redeem 88 certificates, of the nominal value of £8,800.

Telegraphic communication was established between Malva and Los Angeles, Chili, March 5th.

The Guayamas, Mexico, paper of February 25th says, the wire and all required instruments for a telegraph line from Mazatlan to Uris in Sonora, had arrived in the City of Mexico, and the construction of the line will hardly be delayed a great while. A connection ought soon to be made from Tucson, Arizona, to Uris.

The new Government or administration, in Queensland, among other important reforms in the colony, promise a reduction in telegraphic charges.

All telegraph operators engaging with the Grand Trunk Railway are required to sign a pledge of total abstinence from all intoxicating liquors. This pledge is required of all other operators of that road as well.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Table with columns: APRIL, WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows for dates 16, 17, 18, 20, 21, 22.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended March 10, 1874, and bearing that date.

148,447.—ELECTRIC INDICATOR FOR ELEVATORS.—Augustus Hahl, Washington, D. C. Application filed February 7, 1872.

Indicator on elevator is connected by a flexible conductor to a stationary battery and to circuit closers on each floor.

1. The circuit making and breaking apparatus d' d', &c., and the connecting conductor M or n, in combination with an indicating apparatus E, arranged upon the car so as to be movable therewith, substantially as and for the purpose as described.

2. The weight w and pulley p, in combination with the cable M of an electrical indicator for elevators, substantially as and for the purposes herein set forth.

148,459.—ELECTROPLATING APPARATUS.—William C. Holman, West Meriden, Conn., assignor to The Meriden Britannia Company, same place. Application filed December 27, 1873.

Upon a certain determinate weight of plate being deposited on the articles in the bath a weighted arm is pulled down, simultaneously breaking the circuit to the bath and articles, short-circuiting the battery, and operating an alarm.

1. The combination of the revolving frame N, the lever L K, the cup T, the magnet R, and bar a, constructed and arranged substantially as described, the said bar a being tripped to break the main circuit, when the circuit through the magnet is closed by the rising of the lever L.

2. In combination with the supporting frame N, lever L K, magnet R, and bar a, the mercury cup H, making the connection between one pole and the frame N, substantially as described.

3. In combination with the supporting frame N, lever L K, magnet R, and bar a, the hammer V and bell X, substantially as and for the purpose described.

148,469.—ELECTRIC CLOCK.—Johann B. Kerz, Mainz, Germany. Application filed January 9, 1874.

An elastic arm attached to one of the arbors of a clock train, at each revolution, strikes a stud, against which it is first strained, then suddenly passes and strikes a connecting key, which completes an electric circuit through an electro-magnet in a clock at a distance. The magnet operates the hand moving mechanism of the distant clock.

1. The combination of the revolving elastic arm B, operated by a clock movement, with a circuit-closing key, C, constructed and operating substantially as described.

2. The combination of mercury cups D D with the gravitating key C, elastic arm B, clock movement A, electro-magnet F, armature lever G, and ratchet wheel J, all constructed and operating substantially in the manner herein set forth.

148,517.—ORE SEPARATOR BY USE OF MAGNETS.—John Y. Smith, Pittsburg, Pa. Application filed February 18, 1871.

The magnets are arranged to form a cylinder, around which passes a belt.

1. In combination with a magnet-cylinder, drum or roller H, and belt G, an auxiliary belt, G', and pulleys for controlling the relative speed of the belt and cylinder, substantially in the manner and for the purpose set forth.

2. The mode of attaching the magnets to form the cylinder, by means of the disks B and rods D, substantially as set forth.

3. In combination with the magnets C, the annular and adjustable keeper E, substantially as set forth.

4. In combination with the hopper and magnets, the brush I, when arranged to feed the ore or other fine particles from the hopper.

5. In combination with the magnet-cylinder, the combs K, arranged to operate substantially as set forth.

6. In combination with the magnets, the non-magnetic surface extending at the end of the cylinder beyond the influence of the magnetic force, and means for sliding the magnetic particles on such surface.

For the week ending March 17, 1874, and bearing that date.

148,608.—AUTOMATIC FIRE ALARM AND CIRCUIT THEREFOR.—John H. Guest, Brooklyn, N. Y. Application filed February 7, 1874.

A number of thermostats, placed in main closed circuit of a district alarm or other telegraph line, close, when acted on by heat, a branch circuit through an alarm and signal mechanism without destroying continuity of main circuit.

Claim.—1. The combination of a fraggible hmb or tube with a spring, b, for making or breaking an electrical circuit, substantially as set forth.

2. The combination, with an electrical circuit, of one or more fraggible tubes or bulbs, controlling circuit closing or breaking devices, substantially as set forth.

3. The combination, with the normally closed circuit of a district, alarm or other telegraph line, of branch or local shunt circuit, a suitable alarm placed therein, and thermostats controlling such circuit, substantially as set forth.

4. The combination, with one alarm apparatus, of one or more thermostats, and an electrical circuit operating such alarm and controlled by the thermostats, substantially as set forth.

Obituary.

H. R. MYERS,

who committed suicide at the Central Hotel in Chicago, Ill., on the morning of April 10th, 1874, was originally from York, Penn., and first came under our notice in 1864-65. He was at that time operator for the Phila. and Erie R. R. Co. at Renova, Penn.; subsequently he accepted a like position at Kane, Penn. From there he went to Washington, D. C., to work for the W. U. Telegraph Co. Resigning his position there he again took up R. R. telegraphing—this time on the Meadville Division of the Atlantic and Great Western R. R. Here he gained such favor with his employers, that he was offered and accepted the responsible position of agent and operator at Glendale, Ohio, on the O. H. & D. Division of that road, having previously worked at Middletown, Ohio, where he became acquainted with and married a beautiful and accomplished young lady. He was thrown from a car on the side track at Glendale in endeavoring to set a brake on it, the chain of which broke, and injured him so as to incapacitate him from performing the laborious duties devolving upon him there, and he resigned to accept the responsible position of manager of the Pacific and Atlantic Telegraph Company's offices, at Baltimore, Md. Previous to his entering the telegraph ranks practically, at the early age of 15 years, we find him conductor of a local freight train on the Northern Central R. R., between Harrisburg and Baltimore, enjoying the confidence not only of the older conductors, but also of the officers of the road. About a year and a half previous to the great Chicago fire, he accepted the position of manager of the Pacific and Atlantic Co., in Chicago, being in the full enjoyment of the entire confidence of his employers. His close application again told upon his health, and after the disaster which entailed so much loss and so many unfortunate changes upon thousands, he resigned this position, and for a long time was out of permanent employment. He visited successively most of the Eastern cities in hopes of locating himself in a business to accord with his inclinations and abilities, but no opportunity for this offered itself. He was afterward in Dayton, Toledo, and various points in Canada, where, from time to time, he fell back upon his knowledge of telegraphy, and obtained transient employment as operator. About six months ago he returned to this city and obtained a position in the Western Union office, working alternately the second New York wire—Smith report and Omaha duplex. He was a skilful operator, and from this fact was held in high esteem by his employers, and, by his many social and genial qualities, made for himself many friends among his fellow operators. About three weeks ago his wife went to Middletown, O., to visit her mother, taking with her their two little girls, and leaving Myers to make the necessary arrangements for their going to housekeeping upon their return. Myers, in the meantime, took board at the Central Hotel. It appears that after the departure of his family, the loneliness that succeeded induced a morbid and unhappy condition of mind. He could not be brought to look upon the bright side of things for the future. He became dissatisfied, discontented and misanthropic. His position was not worthy of his business capacity, the prospects of providing for his family in a manner according with their tastes and desires appeared dubious, and he became morbid with the reflection that his life was unsuccessful, and that his future was destined to contain nothing but misfortunes. This unhappy frame of mind induced

a mental aberration from which he was unable to extricate himself.

On yesterday morning he entered the barber shop of the Central Hotel, at about 6 o'clock. After lingering there a few moments he disappeared. Late in the afternoon the door of his room was found to be secured, and upon an application being made for admittance no response was elicited. Fearing that all was not right within, the door was forced open and he was found lying on his back upon the outside of his bed, dead, dressed as usual, except that he had on his dressing gown and was in his stocking feet. A pistol lying by his side told the sad story of self-destruction. He was peculiarly involved, and this, added to his other train of misfortunes, no doubt induced the untoward deed. He was but 27 years old, and, in spite of the failures at the outset, might have lived to enjoy a life of prosperity and influence. He has a father and mother residing at Dayton, O., and a brother in Baltimore, also two brothers residing near Dayton, O., and several sisters married, residences unknown. However unfortunate and unhappy may have been his latter circumstances, his influence and position were ever at the service of the poor and needy. He was generous to a fault; an affectionate husband, loving father, and faithful friend. He had left the office by the permission of the manager the first two evenings of this month to make arrangements to go into other and more remunerative business, failing in which he became more and more discouraged. Catching a severe cold about this time, he was seized with his old complaint, inflammatory rheumatism, which confined him to his room. He had apparently contemplated destroying himself, as he made casual inquiries (during the first few days of his confinement to the hotel) of the Asst. Observer Sergeant as to the best place to shoot one's self about the head to produce instant death without marring the features, and acted upon the information received exactly.

It seems he had all things prepared, his trunk packed, accounts arranged as far as possible, and kind loving letters written to his wife and a friend, on the 7th instant, but some brother operators calling that afternoon and evening seemed to cheer him up and delay the perpetration of the deed. He also had written a letter to the Coroner and his jury and left in his pocket, as well as all the others, in care of a friend. The following is a copy of the letter to the Coroner:

"Room 101, CENTRAL HOTEL, CHICAGO, April 7, 1874.
"TO THE CORONER AND HIS JURY—*Gentlemen*: You may be called upon to serve me in an official capacity. You may render a verdict as follows: Tired of life; tired of the trials, troubles and inconsistencies of both public and private life, excepting my wife and children and a few chosen friends. To the former my heartfelt love and undivided affection, with kisses. To the latter, my sincere, and, I hope in life, as in death, my unadulterated friendship and love. To my wife and dearly beloved children, Mizpah. HARVEY R. MYERS."

He was a member of the Masonic fraternity, belonging to Union Lodge No. 60, Baltimore, Md. His anxious inquiries for several days previous to his death for a letter he was expecting from his wife, gave rise to the rumor that he had family difficulty also, but the rumor, we are happy to state, was without foundation. The letter he was so anxiously expecting was taken out of the letter box at the telegraph office by a repairman named "Myers," read, and, as not understood, destroyed, and no mention made of it until after the suicide. * * *

SPECIAL NOTICE.

That "THE BEST IS ALWAYS CHEAPEST" is demonstrated by the unprecedented demand which has arisen for our

EXCELSIOR TELEGRAPH APPARATUS

for Students and Amateurs. The custom introduced by us of making Agents of managers and operators, and sharing the profits from the sales of these instruments with them, has also assisted in increasing our sales to such an extent that we have been compelled to enlarge our facilities for their manufacture.

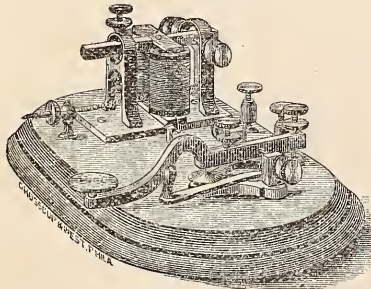
We are now prepared to furnish these unrivalled Amateur Instruments, with or without Office Outfits, in any quantity and at a moment's notice. Our Agents may now send in their orders as rapidly as they please, and can rely upon their being promptly executed. Prices as heretofore.

Instrument complete, Key and Sounder..... \$6 50
Instrument with Office Outfit..... 7 50
Two Instruments and Outfits..... 14 50

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FULL SIZE RAILROAD SOUNDER AND KEY.

Nothing made of cast or painted iron. Is finely finished, mounted on Walnut base.
1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D.....\$12 50
If money be sent in advance by registered letter..... 12 00
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Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

THE

TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"

"History of America," "Civil War in America;" Member

of many Scientific and Learned Societies of Europe

and America; Commander of the Order of Dan-

nebrog, Denmark; Order of St. Olaf,

Norway, and of the Sword Order,

Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guerike, Hawksbee, Gray, Wheeler, Du Fay, Muschenbrock, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and of his improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ørsted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

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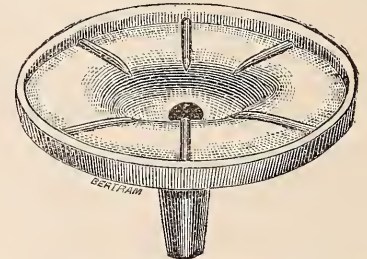
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PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

A SOUNDER FOR 30 CENTS.

THE "SNAPPER,"



a Mechanical Sounder and Key combined—giving a remarkably sharp and clear sound—weighs but half an ounce, and can be carried in the vest pocket.

EVERY OPERATOR,

EVERY AMATEUR,

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wants one. Sent post paid on receipt of THIRTY CENTS; Six for \$1.50.

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THE AMATEUR TELEGRAPHIC INSTRUMENT.

This instrument is in some respects similar to the "SNAPPER SOUNDER," but differs from that device very materially in the matter of form, finish and consequent DURABILITY. The base is composed of the best metal, highly polished, the Spring being Nickel Plated, and capable of producing a clear and pleasant sound. All who have used this instrument pronounce it to be par excellence. Sent to any address, post paid, on receipt of 50 cents.

The "SNAPPER SOUNDER" will be sent for 25 cents.

Very liberal discount to Agents.

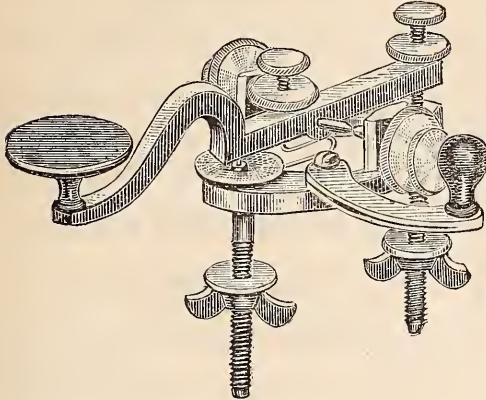
Address,

J. M. FOSTER,

397 Broadway.

Late Manager Am. Dist. Tel. Co.

WATTS & CO.,
BALTIMORE, MD.



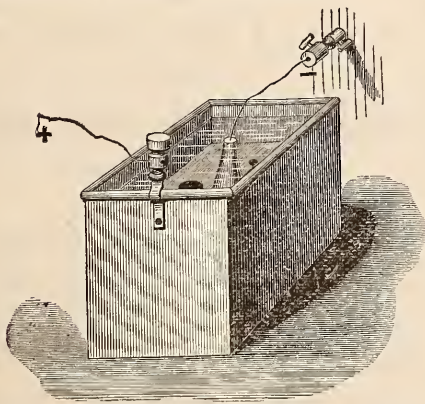
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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GEO. H. BLISS & CO.,
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TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
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- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

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 - VAUGHAN'S AUGURS and TOOLS in variety.

- SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

- TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.

- SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

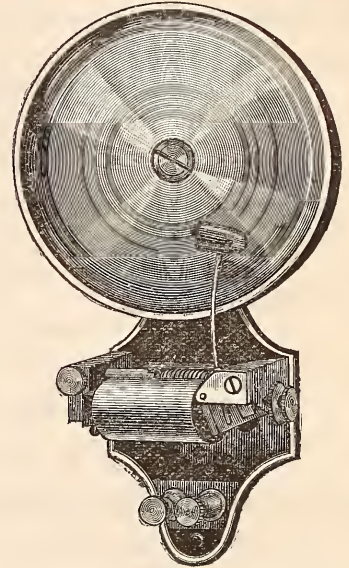
Repairing and Model Work promptly attended to.

Bliss' Manual and Price List furnished free on application.

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Manufacturer of
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Between Fulton and John Streets, NEW YORK.



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50
The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.
In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.
The Platina Points are large and hard.
Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight. \$50 00
Sounders, from..... 4 50 to \$6 50
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MANUFACTURERS AND DEALERS IN

Electrical and Telegraph Instruments.

A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS
CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,
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PATENT ELECTRIC WATCH-CLOCK

THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection
MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS
AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

TILLOTSON'S POCKET
INSTRUMENTS,

IN HARD RUBBER CASES,
NEATNESS, COMPACTNESS and UTILITY COMBINED.
Will work on circuits of any length.

L. G. TILLOTSON & CO.,

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AERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH
WITH A CENTRAL OFFICE,
OR
UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is made for evidence of its great

SUPERIORITY, VALUE

AND
UNIFORM RELIABILITY.

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| Albany, N. Y., | New York City, |
| Alleghany, Pa., | New Orleans, La., |
| Boston, Mass., | New Bedford, Mass., |
| Bridgeport, Conn., | New Haven, Conn., |
| Buffalo, N. Y., | Newark, N. J., |
| Baltimore, Md., | Omaha, Neb., |
| Chicago, Ill., | Philadelphia, Pa., |
| Cincinnati, Ohio, | Pittsburg, Pa., |
| Columbus, Ohio, | Portland, Maine, |
| Cambridge, Mass., | Peoria, Ill., |
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| Covington, Ky., | Quebec, L. C., |
| Detroit, Mich., | Rochester, N. Y., |
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes.**

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM

AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY, RELIABILITY and ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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104 Centre Street,

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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These Instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAI TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made.

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.
 This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.
 This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.
 These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.
 Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
PRINTING TELEGRAPH INSTRUMENTS
 manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES
 constructed in the best and most substantial manner, and on reasonable terms.
 Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer.
 For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.
S. J. BURRELL, Superintendent,
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A AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.
 Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
 CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.
 And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.
 Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

EFFICIENCY AND RELIABILITY.
 Address—
American Compound Telegraph Wire Co.,
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
 FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.
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 OFFICES:
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This Instrument is offered to the public as the oldest, most rapid, and best.
MAGNETO-DIAL TELEGRAPH
 in the world.

It has already been extensively adopted and has invariably given entire satisfaction.
 They also manufacture and put up
THE ELECTRO-MAGNETIC WATCH CLOCK,
 which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS
 of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
ETC., ETC.,
OF ALL KINDS.
 All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
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 OF
EVERY DESCRIPTION,
38 VESEY STREET, New York.
 NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.
 In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as
BATTERIES, INSULATED WIRES, CHEMICALS
 of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,
 For Amateurs and Learners, and Short Lines.
GLOBE LIGHTNING ARRESTERS.
Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.
BRADLEY'S BOX RELAYS AND SOUNDERS.
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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.
 Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.
 Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.
 The demand for this Battery is rapidly increasing, and it is needed by all who have used it to be the Best and most Economical Battery, for telegraphic and other purposes, offered to the public.
 Descriptive Circulars and Price List forwarded upon application to

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 OFFICE WIRES, MAGNET WIRES, of every variety.
 SUBMARINE and SUBTERRANEAN TELEGRAPH CABLES, all sizes, on hand and made to order.
L. G. TILLOTSON & CO.,
 8 DEY STREET, NEW YORK.

REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL TELEGRAPH APPARATUS,
 For AMATEURS, STUDENTS and SHORT LINES.
 Since the introduction of this Pioneer Low Priced Telegraph Instrument, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.
 Hereafter we shall furnish them at the following popular rates:
 Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00
SEND FOR CIRCULAR.
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PARTRICK, BUNNELL & CO.,
38 SOUTH 4th ST., PHILA.,
 MANUFACTURERS OF
UNRIVALLED MORSE INSTRUMENTS
CHAMPION LEARNERS' APPARATUS,
 with Complete Instructions, Battery, Wire, etc.,
GIANT SOUNDERS,
Improved Curved Keys,
 Batteries and Supplies of every Description.
 Send for Circulars and Catalogue.

DR. L. BRADLEY,
No. 9 Exchange Place,
JERSEY CITY, N. J.,

Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

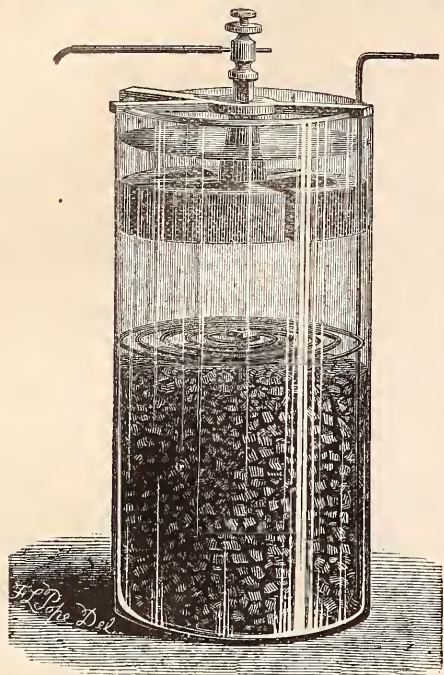
UNIVERSAL APPARATUS
 FOR
ELECTRIC MEASUREMENT,
 Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.
 Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
 Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his
CELEBRATED HELICES
 WHICH ARE OF
 Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionably stronger magnet, while the resistance will be the same.
 These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

SMITH'S
MANUAL OF TELEGRAPHY.
 PUBLISHED EXCLUSIVELY BY
L. G. TILLOTSON & CO.,
 Price 30c. **8 DEY STREET, NEW YORK.**

THE PERFECT BATTERY. CLEANLINESS. CONSTANCY. ECONOMY.



THE LOCKWOOD BATTERY, PATENTED APRIL 8, 1873, L. G. TILLOTSON & CO., Sole Agents, No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY AT THE CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

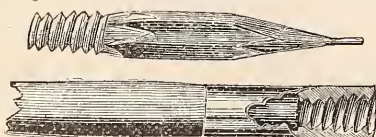
The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is NO LOCAL ACTION, and the circuit is ABSOLUTELY UNIFORM at all times. It is equally well adapted for a LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current. The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO. 8 DEY STREET, NEW YORK, SOLE AGENTS.

New York, Oct., 1873. We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery. LOCKWOOD BATTERY CO. W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

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A Journal of Electrical Progress.



Vol. X.

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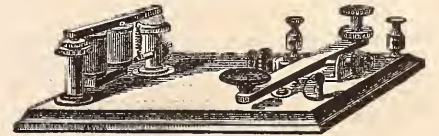
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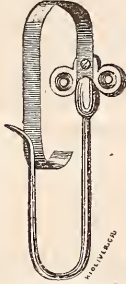
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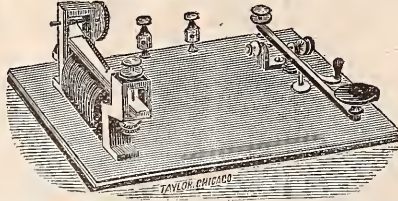
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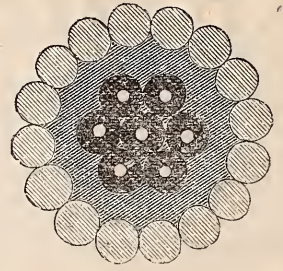
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MAY 2, 1874.

VOL. X. WHOLE No. 407.

Original Article.

"Pip, Poor Pip!"

BY PETE ROPEYARN.

THE interesting sketches of Jim Lawless, Tip McClosky and others, which have recently appeared in THE TELEGRAPHER, have brought up recollections of another prominent telegraphist, not unknown to fame and fortune, of whom, it is believed, some reminiscences will not prove devoid of interest.

"Pip, poor Pip!" and yet he is neither poverty stricken or dead. I take a long retrograde step in the above caption, and, if it should be recognized by some ancient telegrapher who knew him in his days of callow youthfulness, it may be said, "Well, he was poor, it is true, and there was not a boy that took his turn on the bench who drove for a 'thirteener' with more earnestness than Pip." Bright, intelligent, ambitious to excel was he, and the Morse Alphabet was but a slight obstacle in his path to future telegraphic glory. A happy day was it for our hero, though it did rain, and "N. Y." came slow and shaky over old No. 2, when his quick ears caught the letters "B. Buf—" How every boy on the peripatetic force loved that rotund form, whose office was so happily located just beyond the "free limit." It must have been on the following day that a "garrote" collar appeared on duty, enclosing within its radius the stubby neck of Pip. As he took the pile of overnight messages out of the rack and hastily glanced through them, a looker on would have supposed that the collar had encircled his neck when his eyes first saw the light, so indifferent was his air when the voice of envy from his conferees squealed out, "What a swell!"

Our hero was not of the kind who could be scoffed down, however; and, by that gift of pluck and indefatigable perseverance which, when possessed, is the basis of success, not many months elapsed before he was placed in charge of a "paper mill" in the rural districts, where his frantic efforts to copy by "sound" became a severe trial to the patience of Dwight Case, who was at that time sole proprietor and manager of the old "Shore Line" wire, notwithstanding the constant admonition to "let his paper run." Pip toiled early and late, and to such good purpose that but a few weeks elapsed before he again appeared in his old haunts, but no longer in the subordinate position of a messenger. As yet, however, he lacked confidence to cut entirely loose from his register, but doing so was only a question of time, and when eventually the old office, which had been the scene of his advancement from the lower round of telegraphic service, was abandoned, he felt a joyful relief in thinking that that old "quill wheel" would no longer encumber his desk. Fancy, then, the feelings of poor Pip, when, among the apparatus of the new office, he discovered a brightly burnished register of the latest mud-turtle pattern. The manager, not being an expert sound reader himself, had insisted upon providing for the possible contingency of an operator getting stuck with some obscure word, and had consequently fitted up a table ostensibly for the benefit of the whole force, but in reality as a resort for Pip, when wrestling frantically with a pile of business from "P. FR."

From this point in his telegraphic career his road to final success did not differ essentially from that of others who have traversed the same path. We all "know how it is ourselves" from sometimes painful experience, but to one who, like Pip, knows no such word as "fail," the result is assured. His only failing was a ragged copy. The length of a "set to" with New York could usually be accurately estimated by the number of skeletons which encumbered his desk when he gave his final O. K. Blessed with a retentive memory, however, these were usually padded and patched until they were barely approved of after a critical inspection by the lynx-eyed manager. None knew better than himself the weak point in his professional achievement. "Pete, my boy," said he, "if I could only turn out a copy like Jim Lawless I would die happy."

Doubtful of his ability to excel in quality, he determined to achieve a national reputation for exceeding in quantity. Fortune favored his plans, for only forty miles distant was located the "Hub," and within its

precincts was the champion sender of that period, extensively known professionally as the "Knight of the Golden Key." The preliminaries being arranged, the Public Library was ransacked, and from a dusty alcove was abstracted a volume containing no words of more than two syllables. The circuit being short, a rainy night was chosen that the cooling drops might contract the excess of caloric, generated by friction on the wire. In spite of almost superhuman efforts to keep the affair secret by advertising it in all the Provincial newspapers, the Governor of the State was obliged to order out the Ancient and Honorable Artillery, whose guns, the admiration and terror of the orderly and turbulent of the city's populace respectively, were planted on the bridge, commanding the canal, and thus the streets were kept clear of the crowd of enthusiastic citizens. At the expiration of one hour the chairman of the committee, under whose supervision the performance took place, appeared at the office door, grasping in his hand half a ream of tissue paper. The pages were divided among a dozen men, who immediately proceeded to count the words. Another hour elapsed before the chairman again appeared, and announced the result. A tremulous murmur ran through the crowd—ten thousand words in sixty minutes—and then the artillery on the bridge belched forth a salute of nineteen guns, one for each year of Pip's life, and his reputation was established.

Twenty-four hours had not elapsed before the record of this remarkable feat became the topic of conversation in every telegraph office in the country. There was one man, however, who discredited the whole thing. Tip McClosky said he might swallow 8,000, as he had done that himself, but 10,000 was too many. He would investigate. He was then at Salt Lake, but he threw up his job and started East, determined either to nail a lie or surpass the feat. His first step was to see the committee and inspect the copy. He went faithfully at work, and having assured himself that there were 10,004 words in the copy, he proceeded to read it. There was a striking similarity between some of the pages. He went carefully through them again, finding, first duplicate and then quadruplicate pages. The African in the fence was discovered. The committee, composed of elergymen, deacons and other truly good men, were innocent of all knowledge of the black art of manifolding, and had been beguiled into the belief that 10,000 words had been received, when in reality the number was 2,500 copied on four page manifold. Tip McClosky was elated. Hurriedly scratching off a few lines he rushed to the nearest news-paper office, and handed in his communication. A young man in the office glanced at the name, blandly said "All right," and Tip dug out. The card never appeared. That young man was Pip. His literary aspiration had brought him in close communion with the editorial sanctum, and he availed himself of this opportunity to prevent the overthrow of the pinnacle of glory on which he had then taken his stand.

Glory, however, is a vapory foundation, unless backed by stamps. To unite glory, reputation and literature with the golden band of financial prosperity was now the future aim of Pip. With this end in view, he pondered long and earnestly as to the most available road to wealth. Blessed with a hearty appetite, it was natural that his inclination should tend to the alleviation of the stomach's cravings. Among the most prosperous merchants in the locality was a lineal descendant of Sir Walter Scott. His success as a peripatetic caterer had often aroused the envy of the hash fiends on his route, who little realized that as much labor was expended in the manufacture of sewed and pegged pies as was requisite in the demolition thereof. Scottie's external appearance was not calculated to add to the relish of the viands he peddled, the solidity of which was such that the heavily laden basket had gradually skewed his form, and even twisted his eyes, and given to his whole figure a delapidated air not unlike the spring opening of a last year's scarecrow. The red flannel shirt in which he always bloomed out was carelessly adorned with daubs of printer's ink, a series of impressions from which were gradually transferred to his face by a rolling movement of the left arm, his physiognomy having been previously wet down with profuse perspiration. Whether any radical reforms were inaugurated upon Pip's accession to an interest in this nocturnal lunch route remains a secret, which will not be revealed until the trumpet of Gabriel shall have summoned the victims before the last tribunal.

Meanwhile the literary germ was expanding within the brain of our hero, and by judicious training he bade fair to become in the New England what Dickens was in the old. His close relations with the press, derived from frequent visitations to the editorial sanctum to offer suggestions as to the interpretation of night reports, soon paved the way for future contributions. These, again, were followed by a permanent connection as "local" with the *Plantation Harbinger*. It was while in this position that some remarkable literary feats were performed. A copy of the *Harbinger*, containing a local sketch, found its way into the hands of a New York operator. For the amusement of his col-

leagues the recipient volunteered to read it aloud. He opened glibly, and read fluently until he reached a sentence about the middle of the article. He had spun out about fifty words, when he began struggling violently to reach a punctuation mark; his voice grew fainter and fainter; he gasped; he grew black in the face; still he persevered until he lisped the seventieth word, when he gave one despairing glance down the column, and still that full stop was five lines ahead. The last effort was exhaustive. He fell heavily to the floor, and the reading was not yet finished. A man of greater lung capacity was required. The by-standers shouted "Morrison." Frank gaily responded to the call, and came up smiling. He commenced afresh, and read without faltering until he reached the eightieth word, when, warned by the fate of his predecessor, he threw up the sponge. It was evident that his voice was so heavy that it required all of his extra lung power to manipulate it. The occasion demanded a man of equal or greater wind capacity and a voice of less volume. All eyes turned instinctively to John Lenhart. Blushing with his usual extreme modesty, John came to the front. Profiting by his observations, he threw back his shoulders and sailed in.

The trial was a severe one, but the goal was reached at length, and the sentence completed. A feeling of envy was aroused, by the successful rendering of this sketch, which was the forerunner of a subsequent outbreak of hostilities between the principal contestants.

The *Plantation Harbinger* was not blessed with a robust constitution. It had, however, struggled through many years under different titles, and through changes of ownership, as one after another of its proprietors had sought the refuge provided for the impecunious by the munificence of a former wealthy citizen—had survived even the editorial inflictions of another telegrapher, whose journalistic connection has made his name a household word among the fraternity of the North American Continent, until shortly after Pip's withdrawal from its staff. Whether his literary efforts had planted the seeds of dissolution within it, or whether it languished because of his absence, is a question of more interest to the ereditors of the deceased than to the readers of this sketch.

It becoming evident that none of the provincial journals were endowed with sufficient vitality to withstand the pressure of his vocabulary, Pip made a sudden change of base to the metropolis. "Pete, my boy," said he, "there's a pile of money in Gotham, and I've made up my mind to come here and scoop some of it in. By the way, what pay are you getting now?"

"Two hundred dollars a month, Pip, that's about as far as I expect to get."

"Poor fellow, I don't see how you can live, and a family to support too. Why, my washing and cigars cost me more than that."

A feeling of envy rankled in my bosom as I pondered over my abject condition. Heretofore I had been contented with my lot.

Blessed with good health and spirits, surrounded by staunch friends, engaged in congenial employment, affording me all the necessaries with a fractional part of the luxuries of life, I went to my quiet home that night to indulge in the erection of air castles and the possibilities of bettering my condition. A few hours' rumination assured me that any purely artificial effort to expand my natural abilities beyond their legitimate orbit might reduce me to the questionable comfort of a sky parlor in a metropolitan hash house.

Life is rendered pleasant by the variety of characters which it presents. Out of these few will leave behind them a record of good deeds, actually performed, as deservedly as Pip. A faithful and industrious telegrapher, loved and respected by his associates, he has struggled manfully against the adverse currents of life. Stimulated by prosperity, and again bowed down with grief, he still labors with the same indomitable zeal; and whatever may be his future career, the wrecks of other adventurers in the same sea will never form the foundation to the success of Pip.

Later Telegraphic Experiences.

SINCE my "Early Experiences" appeared in THE TELEGRAPHER, more than two years ago, I have been obliged to wait awhile, if I desired to give you my later ones, in order to let them accumulate. Meanwhile I had nothing to write of in THE TELEGRAPHER, as it is essentially devoted to one idea; and as I am the proud owner of one and a half, I like to have an opportunity of giving the half a chance occasionally.

Sitting within the narrow limits of my office day after day is not conducive to the development of much brilliancy, and if it was not for a message now and then a little out of the ordinary character, to vary the monotony of business, we operators would rust out. Before I knew anything of the business I anticipated much pleasant variety, and some gratified curiosity, in being the recipient of so many confidences, but how woefully I have been mistaken! With what a dreary sameness every message of a business character is written, and these constitute the large majority of the

whole? From force of habit, we unsentimental ones are so surprised when some anxious friend or fond lover sends a sweet word, regardless of publicity, that we say "Ha!" after our O. K., or "Pity about him or her!" as the case may be. Of course, if it was to one of us we should look upon it in an altogether different light.

I have learned a few things during my three years of telegraph operating. One is, that, as a rule, our offices are confined to very small quarters (at least in the city), I suppose for the reason that we need very little room for anything besides a desk. Other kinds of work you can leave for a while, or change your place; but with ours you must keep within hearing of the sounder, or else there is some sharp talk for you when you do answer. For the reason that we are compelled to be always on hand, the little space we occupy ought to be every way comfortable, especially as there are so many women in the profession. And this brings to mind what I have long thought, that eventually the whole of the work will pass into the hands of women. They are adapted for it in every particular, except, may be, as regards night work, which they could endure probably just as well as men; who find it none too healthy, and keep out of it when they can. In all, or most all other businesses, there is expected promotion; in telegraphy there is none, or the places are so few that there is no demand. An expert operator thinks a salary of \$100 per month a good one, while if he gave the same time and ability to another work he would be much better compensated. This is the real reason why so many young persons of both sexes take it up. A moderate salary suffices for their present wants; as for the future, they will look out for something that pays better.

It is the same in this as all other employments in which women are engaged, the pay is disproportional between their's and men's labor. A woman who gives as many hours, does her work under the same restrictions and obligations as a man, receives for it half as much pay. "But she is not equal to working long wires," they say. She has not been fairly tried. In the few instances we know of they have been fully able for the work assigned them. What woman cares to work a heavy wire with no better wages than she receives for a light one? The men would not ask for a choice if they profited so little by it. Within a few years telegraph schools have multiplied rapidly. There is hardly a city without one, and the young people are attracted by the comparative ease with which it is acquired to make it a help to defray their incidental expenses or a partial means of providing for their wants. Young girls or boys who have homes need just this much money to add a little luxury or amusement to their life, and telegraphy, costing but a trifle, is taken up temporarily. The old complaint, want of thoroughness, holds good here for both sexes. The better speller, penman, grammarian you are—in fact the more general information you have—the better prepared you are for telegraphic work. If the business of an office is responsible, it requires judgment and ability to do it well, and the more mature and better the business qualities of a man or woman, just so sure will the company he or she works for be benefited by them. The delay (except in bad weather), the mistakes in checks or otherwise, which too often are not noticed until the message reaches its destination, far or near, and numberless other little things, are almost always the fault of incompetent operators. They seem to forget that a telegram is sent instead of a letter, to hasten some proceeding or prevent some catastrophe, and that speedy delivery is expected.

In saying what I have, I do not mean to discourage any one who is looking forward to earning a living by telegraphy, but rather to inspire her and him with a desire to do every branch of it well, and without loss to themselves or their employers. M. H.

That Little Bill.

If a passer-by should notice a melancholy look on the face of a Dutch tailor, standing at the door of a certain building in this city, his dejected appearance may be accounted for by the following circumstances: A young telegrapher residing in an adjoining town obtained a more lucrative position with a New York company. Previous to his change of base he had entered into a contract with a resident tailor for a new coat, deliverable one week from date. The time having expired the coat was not forthcoming. "I could pay no puttons good enough. I wait ein week. I go py New York, and get somedinks dat is much petter ash I get here." Another week passed by with a similar result. "All delinings as I could get in dis town was no goot. I was peen to New York all retty, and he be done on Saturday, so help me."

The coat being finished eventually, the young man changed his boarding place instantly, and thought it would be no more than fair to keep the Dutchman waiting for his pay as long as he waited for the coat. The tailor didn't see it in that light, so on the next pay day he planted himself in the doorway to await the

departure of his victim. Dick had caught a glimpse of the obstacle at the door, and placed himself in the hands of his friends. They were swarthy linemen and equal to any emergency. While the Dutchman watched at the upper door, a rope was quickly tied around Dick's diminutive form, and in an instant he was dangling in the air, and was immediately landed safely on the sidewalk in the midst of a gaping crowd, with a week's pay safely stowed in his pocket. At five o'clock the occupants of the third floor filed out of the building, the Dutchman scanning each countenance closely. The man bringing up the rear proceeded to lock the door. "Vere ish dat leedle man vat you call him Deek?" "I dunno," was the response, and the last man locked the room and went home. The tailor—having seen his man, was confident, and suspecting that his creditor was being temporarily incarcerated to evade meeting him, he determined to stick it out. No one felt sufficient interest in the case to watch him, but it is generally supposed that he did not reach home till midnight.

How the British Government Telegraphs Pay.—An Increasing Deficit.

WE have been so long accustomed to hear of the vast benefit which society is to reap when Government takes possession of the railways, that one becomes curious to know what has been the result of their administration of the telegraphs. Well, certainly, after all that has been said in the way of blowing the trumpet of Government management, it is a matter of surprise to find that recent investigations have shown that their management of the telegraphs—a matter far more simple than that of the railways—has been anything but one of an encouraging character. Some time since we called attention to the fact that, although three or four years have elapsed since the Post-office authorities took possession of the telegraph lines of the country, the Treasury has not as yet paid the railway companies for the surrender of those lines which belonged to them. We have heard chairman after chairman, at the recent half yearly meetings, state that all attempts to obtain a settlement of their claims have been futile.

We know that last year a good deal of scandal was created, owing to the officious zeal of a gentleman connected with the Telegraph Department in applying towards its development a sum of money belonging to the Post-office revenue, and not condescending to wait for the constitutional sanction which is considered essential to the good government of public offices. The Post-office is again this year the mile cow of the Telegraph Department, for we find in a report just presented to Parliament that, practically, it is the Post-office which defrays the salaries of the officers engaged in that department. It further appears that, notwithstanding this friendly aid, the telegraphic net receipts have fallen short by £1,000 per week of the amount required to pay the interest on the purchase money. The original cost of taking over those lines was £3,000,000; but, as we have on a previous occasion shown, it is not likely to be less than £12,000,000, so that unless a considerable increase takes place in the telegraphic business the deficiency each week is likely to be much larger than it is at present. A good deal has been said of the tendency of railway companies to cook their accounts, and charge to capital what ought to be borne by revenue; but it will be seen from what we have already stated about the salaries of the officials in the Telegraph Department, that the Government have rapidly become adepts in the system of making things pleasant. To show this a little more in detail, we quote the report of the Comptroller and Auditor-General. Mr. Scudamore, as manager of the department, receives a salary of £300. Hearing this, one is inclined to protest against the injustice of paying such an officer as the Manager of a great State department a salary of a second or third class clerk in an ordinary counting house; but then Mr. Scudamore draws from the Post-office a salary of £1,500 per annum really for doing telegraph business. The Telegraph Department ought, in this case, to pay £1,800 per annum instead of £300; but, then, that would interfere with the object which the authorities have in view of showing how cheaply they can manage things. Again, Mr. Chetwynd receives a salary of only £25 from the Telegraph Department; but the Post-office makes up his salary to an amount worthy of his position. It is just the same thing in respect to the salaries of the bookkeeper (£100 per annum) and of chief examiner and cashier (£75 per annum each). The Auditor-General says he cannot think, however, that the known valuable services of these gentlemen in connection with the Telegraph Department are fairly represented by such payments. It is just the same with respect to the new buildings as it is with respect to the salaries—the Post-office bears the brunt and the Telegraph Department escapes almost scot free. The Auditor-General says:

"Under the votes for 'Post-office and Inland Revenue Buildings' considerable expenditure has for some years past been charged in respect of the building of the new Post-office, St. Martin's-le-Grand. In this building accommodation is provided, not only for the officials

of the Post-office, but also for the very numerous staff of the Central Station of the Telegraph Department; but no charge in respect of this expenditure has been raised either against the telegraph votes or the telegraph capital account, in the accounts submitted to me for examination; neither am I aware whether it has been taken into consideration in the annual account presented to Parliament under the provisions of the Telegraph Act of 1869. It, perhaps, may be intended to hand over the premises in Telegraph street for postal purposes, and to treat the accommodation thus afforded as an equivalent to that provided for the Telegraph Department in St. Martin's-le-Grand; but even if this should be the case, some independent evidence as to the value of the equivalent would appear to be desirable. It seems to me that I should fail in my duty if I omitted to point out that the Parliamentary account above mentioned undergoes no independent verification by the Exchequer and Audit Department, although it is the only account by which Parliament and the country are enabled to ascertain how far the telegraph revenue is equal to or exceeds the expenses of the management, the cost of maintenance, and the interest on the debt which the acquisition of the telegraphs has created. To do this with accuracy it would appear to be essential that this account should embrace, not merely the expenditure incurred by the Post-office itself, but also the expenditure which such acquisition has occasioned in other public departments."

We quite concur in these opinions, for when we hear it seriously proposed that Government should take over the management of the railways, it is not to be wondered at if we, on the part of the public, are desirous of seeing what has been the success of commercial departments administered by Government, that we may be able to judge how far the policy of State management in such enterprises ought to be allowed to proceed.—*The Railway News.*

The Telegraphers' Mutual Benefit Association.

Assessment No. 61, issued April 24, 1874—Death of George H. Everett.

GEORGE H. EVERETT (certificate No. 1,719, issued Dec. 9th, 1872), died at Tremont, O., March 26, 1874, of consumption.

Members holding certificates numbered up to and including No. 2,194 will please remit for above assessment.

Attention has been called to the last line on page 12 of the By-Laws. Several members understand by it that they must remit direct to the Secretary. Members will please erase the line referred to. Its publication was a mistake.

W. HOLMES,
Secretary.

J. D. REID,
Treasurer.

The British Postal Telegraph Service.

THE estimate of the amount required for the Post-office Telegraph Service for the financial year 1874-75 is £938,339, exclusive of the year's interest on the purchase money for the telegraphs; and the revenue for the year is estimated at £1,270,000. The expenditure is £80,000 more than in the year 1873-74. It includes £10,000 for telegraph extension works; this sum is stated at £50,000 in one place in the estimate, but it is twice stated as £10,000, and if it were £50,000 the total would be £978,339, instead of £938,339, which is declared to be the amount required to be voted. The wires used for public messages alone (exclusive of those which belong to the railway companies, and are used principally for railway and secondarily for public purposes) form a system of 99,842 miles; and the wires leased by the department to private firms or individuals for the transmission of messages on their own special business between offices and factories, and so forth, make a system of 5,730 miles. The total, therefore, is 105,572 miles—79,485 in England and Wales, 12,284 in Scotland, 13,803 in Ireland. There are 3,791 postal telegraph offices—2,744 in England and Wales, 447 in Scotland, and 600 in Ireland. The number of renters of private wires is 993—831 in England and Wales, 131 in Scotland, and 31 in Ireland. The department works submarine cables 420 knots in length, and having a total length of wire amounting to 1,258 knots; and there are cables 459 knots in length, and having a total length of wire amounting to 1,837 knots, which are the property of the department, but leased to and worked by the Submarine Telegraph Company. The year's estimate provides for the payment of £22,500 to railway companies as remuneration for the transaction of telegraph business at their stations on behalf of the Postmaster-General, under the 7th section of the 9th clause of the Telegraphs Act of 1868; also for a payment of £33,000 for maintenance of telegraphs by railway companies; and also £26,500 for annual rents, nominally for way leave, which the Postmaster-General has contracted to pay to certain railway companies, etc., as compensation, in full or in part, for the loss of their reversionary interests of every

kind in telegraph business, way leaves, pole rents, etc. The estimate again this year was submitted to the Treasury too late to be subjected to examination by that department before presenting it to the House of Commons.

Compliment to a Retiring Western Union Superintendent.

THE Houston (Texas) newspapers of April 21st give very interesting accounts of the presentation to Mr. D. P. Shepherd, who was about to retire from the position of Superintendent of the Seventh District of the Western Union Telegraph Company, of a splendid gold watch from his subordinates. The following from the *Houston Daily Telegraph* gives a brief and interesting account of the affair:

Shortly before 10 A. M. on Sunday morning a number of gentlemen dropped into the office of the Western Union Telegraph, to get some "undelivered telegrams," as they expressed it. Capt. Shepherd was all smiles and met his friends cordially, while the employes seemed busy enough at their duties and instruments. Among the seekers for despatches we noticed C. W. Pescay, Esq., Col. A. B. Small, President Texas Express Co., Capt. E. R. Wells, G. W. Gregor, A. J. Shepherd, Charlie Martin of the *Age*, and several others. It seemed as though all the "masters of the mystic wire" were on duty, as we noted the presence of Capt. Bleakley, E. B. Vosburgh, D. W. H. Voorhees, Mr. More, and others whose names escape us now.

As soon as the telegrams were delivered, Sam W. Small of the *Telegraph* stepped toward Mr. D. P. Shepherd, the retiring Manager of this district, and in a few words presented him with a splendid gold watch as a testimonial of esteem from his subordinates.

Mr. Shepherd received the gift in a few feeling and expressive words, saying that he could not make a speech, but that he would keep sacred and cherish the token as long as he lived. He was so taken by surprise that he could scarcely control his feelings. He appreciated thoroughly the kindly sentiments which prompted the gift, and would never prove unworthy of them.

The watch is a magnificent gold stem winder of the latest pattern, made by Chas. E. Jacot, and worth at cost price \$275 in gold. Upon the inside of the case the following inscription is beautifully engraved:

"Presented to D. P. SHEPHERD as a Token of Esteem by his subordinates connected with the 7th District of the W. U. T. Co., Houston, Texas, April, 1874."

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

An American Society of Electric and Telegraphic Engineers Proposed.

CHILLICOTHE, OHIO, April 25th.

TO THE EDITOR OF THE TELEGRAPHER.

I WOULD like to ask a question, thorough the columns of THE TELEGRAPHER, for the careful consideration of our American telegraphers. Let all think it over and speak out.

Why can't we have a *Society of Electric Engineers* in this country as well as our neighbors across the Atlantic?

We have abundant material out of which one might be composed, and one, too, that would be creditable to ourselves and our country. No one can deny but that such a society would be highly beneficial in promoting the science of electricity. Only within the last few years has this science received much study or attention at the hands of our telegraphers. Rapid progress, however, is being made at present, and a Society of Engineers is just the thing most needed. Here are a few names to begin with:

- Moses G. Farmer, Newport.
- George A. Hamilton, Boston.
- Frank L. Pope, New York.
- A. S. Brown, "
- Geo. B. Scott, "
- George Little, Rutherford Park.
- Dr. L. Bradley, Jersey City.
- W. D. Sargent, Philadelphia.
- David Brooks, "
- D. Brooks, Jr., "
- W. W. Smith, Indianapolis.
- C. H. Summers, Chicago.
- C. H. Ha-kins, Milwaukee.
- S. D. Field, San Francisco, and a host of others.

They can be found in almost every part of the country, from the Atlantic to the Pacific. There is no

good reason why a society should not be formed at once. Let us hear from all interested.

I. N. MILLER.

Congress and the Telegraph.

WASHINGTON, D. C., April 29, 1874.

TO THE EDITOR OF THE TELEGRAPHER.

THERE have been some matters in connection with telegraph affairs occurring here in the last fortnight worthy of record in THE TELEGRAPHER.

You had last week a notice of the passage by the House of the bill introduced by Mr. Giddings, of Texas, for the better protection of the Texas frontier from Indian and Mexican depredations by connecting the military posts there by telegraph. Originally this bill appropriated \$200,000 for this purpose. Mr. Hawley and Mr. Garfield both moved to reduce the amount to \$60,000, but finally it was fixed at \$100,000, and passed in this shape. It is now pending in the Senate.

A bill was introduced in the House, on Monday of last week, by Mr. McCormick, to protect lines of telegraph constructed or used by the United States from malicious injury or obstruction, which was referred to the Committee on Military Affairs. It provides that any person or persons who shall wilfully or maliciously injure or destroy any of the works, or property, or material of any telegraphic line constructed or in progress of construction by the United States, or that may be hereafter constructed or owned, occupied or used by the United States, or who shall wilfully or maliciously interfere in any way with the working or use of any such telegraphic line, or who shall obstruct, hinder or delay the transmission of any communication over any such telegraphic line, shall, on conviction thereof, be deemed guilty of a misdemeanor, and be fined not less than one hundred nor more than one thousand dollars, or with imprisonment for a term not exceeding three years, or with both, in the discretion of the Court.

Mr. Edmunds, on Friday last, by unanimous consent, introduced a bill to provide for a commission on the subject of postal telegraphy, which was referred to the Committee on Post-offices and Post Roads, and ordered to be printed. The bill provides "That a commission, to make personal examination and inquiry into the workings and expediency of a system of postal telegraphy, is hereby created, and the same shall consist of three persons, to be appointed and selected as follows, namely: the President shall, within thirty days from the passage of this act, designate an officer of the army above the rank of major, an officer of the navy above the rank of lieutenant-commander, and some person who shall not have been in the employ or interested, directly or indirectly, in any telegraph company or association, but who shall be well informed and practiced in the science of telegraphy; and the said persons, having been designated by the President as aforesaid, shall proceed to make such examination as may be deemed proper, and shall report the facts ascertained by them to Congress."

The House Committee on Appropriations have had under consideration the subject of postal telegraphy, and, after hearing Mr. Gardner Hubbard repeat his stereotyped arguments in advocacy of his scheme for a partnership between his proposed Postal Telegraph Company and the Government, in the telegraph business of the country, postponed the further consideration of the subject to May 12, when Mr. Lowry, of New York, will appear on behalf of the Western Union Telegraph Company.

The *Chronicle* newspaper, of this city, which is an advocate of an exclusive government ownership and management of the telegraphs, is uncharitable enough to assert that Mr. Hubbard is a cat's paw for the Western Union Company, and that this pretended opposition is merely a sham. This may have been what called forth Mr. Edmund's bill, which is given above in this letter. However that may be, it is conceded that nothing practical will be done by this Congress in the matter.

Mr. Hubbard, in addition to his telegraphic projects, is employed by the Combination of Bank Note Engravers and Printers, which is endeavoring to take the work from the bureau here, and divide it between them. In this case private companies can do the work more cheaply and advantageously than the government, according to Mr. Hubbard; but the same oracle sings quite another tune in regard to telegraphy.

Cornell Jewett has had an opportunity, so dear to his heart, of making an appearance before the Senate Committee on Foreign Relations, and getting his name in the newspapers, in advocacy of his bill asking for charter rights for ocean cables between the continents of Europe, Asia and the United States. Jewett pretends to represent, indirectly, the United States Direct Cable Company, which will lay the cable to New Hampshire this summer, as well as certain mythical parties, who he asserts are ready to invest \$24,000,000 in the cable, if Congress will only pass his bill.

This Jewett is one of the perpetual annoyances of Congress, and the newspaper representatives here, and

always turns up with some enormous scheme which amounts to nothing eventually. Congress has once or twice passed bills which he has had presented, but in no instance have they been availed of. In 1867 an Act was passed giving an American company, with which Jewett claims to have been connected, the right to lay and use cables on the Atlantic coast, except the coast of Florida, but no cables have been laid under it. He desires now to obtain more extensive grants, under the plea of anti-monopoly, which, should be he successful, he will endeavor to dispose of to foreign capitalists. It is sufficient to damp any enterprise in the minds of practical men that he should be either really or ostensibly prominently connected with it.

I do not write these things in the interest of any monopoly, but have no patience with such fellows as Jewett, who make a business of seeking to obtain from Congress concessions to dispose of to the highest bidder.

In his so-called argument before the Committee, the animus of the proposed bill was shown by the statement that, as neither Congress nor the people would aid cables, foreign capitalists, *joining American* (Jewett's) interests, desired special charter rights before risking \$24,000,000, necessary for the proposed cables, subject to a cable policy to be agreed upon between foreign nations and our own Government.

In the Supreme Court of the United States a decision was given on Monday of last week in the case of J. P. Humaston, plaintiff in error, vs. The American Telegraph Company. This is the case in which the American Telegraph Company, subsequently consolidated into the Western Union Company (the real defendant in the case), was sued under a contract in regard to the purchase of an Automatic System from Humaston. It was originally tried in the Circuits Court for the Southern District of New York, which gave a decision in Humaston's favor, but awarded only a small amount of damages. From this the plaintiff appealed to the Supreme Court. Mr. Justice Davis delivered the opinion of the Court, affirming the judgment of the Circuit Court, with costs and interest.

Prof. Royal E. House, the inventor of the House Printing Telegraph Instrument, has been in the city for several weeks past. It is understood that he is here attending to some business with the Patent Office. The Professor is in excellent health and spirits, and wears his years and honors lightly. CAPITOL.

California Personals.

CALIFORNIA, April 16.

TO THE EDITOR OF THE TELEGRAPHER.

THE following particulars in regard to the *personnel* of Mr. F. L. Vandenberg's able staff of operators on the Atlantic and Pacific wires may not be without interest to some of your Eastern as well as Pacific coast readers. There is not a "plume" among them:

Mr. H. M. Bennett takes report at "S. F.," and has "Og" den hoop it up, for when Harry gets on a "B" "n" der he wants "30," and is not backward about asking "Og" every twenty words for it either.

Mr. Tom R. "K" nox turns button and copies report in "S" acramento. In the railroad office "H" we hear J. A. "R" obin working as division operator, and the attentive Mr. Tom R. Jones, who "O" verses the overland and 2 of the way wires over the Western and Vallejo divisions C. P. R. R.

We are all interested in the communications from your correspondents on the League Question, but we are beginning to think that it's a superabundance of smoke, with too little fire. P. LUME.

Personals.

MR. ARMON SOPER has resigned his position with the Western Union Telegraph Co. as operator at San Bernardino, Cal., and has returned to his home at Bowmanville, Ontario, Canada.

MR. W. A. BOWEN has accepted the position of operator at San Bernardino, Cal., with the Western Union Co., vacated through the resignation of Mr. Armon Soper.

MR. CHARLES MATTHIAS, of 173 Smithfield Street, Pittsburgh, Pa., desires the address of Mr. LEW FISHER, who worked in the Pacific and Atlantic office in that city in August or September, 1873.

MR. JAMES F. FARRELL, formerly of the Virginia, Nevada, Western Union office, has been appointed Manager of the Carson, Nevada, office of the same Company.

MR. DAVID COWEN has been transferred from the Steamboat, Nevada, to the Carson, Nevada, Western Union office.

MR. C. W. STOVER has resigned the position of Manager of the Western Union Telegraph at Rochelle, Illinois, to engage in other business.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, MAY 2, 1874.

THE TELEGRAPHER:

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38 VESEY ST., New York.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Bound Copies of Volume IX for Sale.

WE have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

The Currency Inflation Question and Telegraphic Prospects.

UPON the passage of the Act providing for inflation of the currency by the U. S. Senate, and in view of its almost certain passage in the House of Representatives, and the probable approval of the President, we made some remarks and suggestions in reference to its effects upon telegraphic interests. The action of the House confirmed the general expectation; but, contrary to the almost universal anticipation, the President—as we think very wisely and very properly—interposed his veto, and the mischievous policy was defeated.

It cannot be denied that there has been a very general feeling of relief that the danger which was so imminent has been avoided, and the country to-day occupies a far better position than it would had the President yielded to the pressure brought to bear upon him, and either signed the bill or permitted it to become a law by neglecting to either sign or veto it, as he might have done. As we conceded in the article referred to it is not our province or desire to discuss in these columns national financial policies, except in so far as they concern telegraphic interests. That the telegraphic interests of the country could be permanently benefited by such a policy as that sought to be inaugurated by this Act, we do not believe; and, although for a comparatively brief season, they might have participated in an unhealthy and illusive exhibition of prosperity, they must have suffered severely in the end, and participated in the general depression and prostration which would have inevitably followed its adoption. The situation as it is is sufficiently difficult, but, with a wise national financial policy, it will gradually improve, and the returning prosperity will have a substantial basis, and if not so rapid as might be desired, will be more satisfactory and more likely to

be lasting, than if based upon an additional issue of irredeemable promises to pay.

It is now probably too late in the season to look for any very marked development of the spring trade, and we do not anticipate that there will be a very pressing amount of telegraphic business during the spring and summer months. Still there is even now an improvement noticeable in the patronage of telegraph lines, though the business offering is by no means equal to that of previous seasons. We may, however, look for a slack spring and summer business, but the indications are that the fall business will show a decided recovery. It being settled that there is no probability of any material disturbance of the currency for some time to come, our business men can act with more confidence, and make their arrangements with less danger of finding themselves unexpectedly involved in loss through fluctuations in the currency. This will in turn furnish patronage to telegraphs, and create an additional demand for telegraphic facilities and services. The fall business is likely to be moderately active, and the worst effects of the late panic will have then passed away, and we hope the country will have started on a new era of real prosperity, in which, of course, the telegraphs will share.

It is not probable that there will be any very extensive additions to telegraphic facilities during the present season, though some additions to the lines of existing companies will be made. Telegraph managers and investors as well as others are inclined to be conservative, and will, no doubt, judge it best to wait a while for developments before making any very important moves. It is not a favorable time for inaugurating new telegraphic enterprises, and we doubt whether any can reasonably be looked for this year. With reviving prosperity and renewed business activity new telegraphic ventures will be made, and all concerned must wait with such patience and resignation as they may for the good time coming. That it will come they may be assured, and delay now will doubtless in the end prove beneficial.

The New Atlantic Cables.

THE new telegraph cable of the Anglo-American Company will be laid during the summer, landing at Newfoundland, and the cable of the United States Direct Cable Company, which is now being shipped on board the SIEMENS BROTHERS' new cable steamship, the Faraday, will be laid, the western end of which is to be landed on the New Hampshire coast. These are likely to be the two most important telegraphic events of the season, so far as this country is concerned. When the new company gets its cable in operation there may be some competition between it and the Anglo-American Company, although, unless the Direct Cable Company can develop some more speedy method of transmission of signals than that now in practice, it would not seem to stand very much show in a competition with its single cable against the five of the former company. Doubtless there will be in time work enough for all the cables; whether it will be profitable or otherwise, of course, depends upon the rates of tariffs which may be adopted. If competition should reduce these to the amount which some of our over sanguine and unreasoning newspaper writers anticipate, the profits will necessarily be inappreciable. As the capital invested in these enterprises is furnished in Europe, and mainly in Great Britain, perhaps it is unnecessary for us to trouble ourselves about the profits of the stockholders, so long as we profit by low rates for telegraph service. It must be remembered, however, that losing tariffs can never be permanent, and that what the patrons of cable telegraphs may temporarily gain by such tariffs will have to be made up hereafter in increased charges. No provisions against consolidations or tariff combinations between the competing companies can prevent this, notwithstanding the assertions of that blatherskite CORNELL JEWETT, at Washington, to the contrary.

In this connection it may not be amiss to state that

representatives of the United States Direct Cable Company disavow any connection of JEWETT with that enterprise or company, notwithstanding his recent attempt by the introduction of a ridiculous bill authorizing him and some mythical associates to lay and operate an Atlantic and a Pacific cable, in which reference is made as though from some authority or connection with the Direct Cable Company. It is but justice to that company that this should be stated, for it certainly will neither advance its interests or credit to have it supposed that he represents them even incidentally and indirectly.

The Weather and the Telegraphs.

If the northern and eastern sections of the country are entitled to any spring, they are this year being defrauded of their dues. Rain, hail and snow, with not infrequent and protracted gales, have characterized April even to its close, and if the May flowers depend upon the traditional April showers to bring them, they certainly will not put in their appearance this year. The closing days of April witnessed the heaviest snow storm of the winter and spring in some parts of the north and east, and rain in unlimited quantities in all parts—north, south, east and west. The weather has delighted our friend Mr. DAVID BROOKS, and his "tests of insulators" have been sufficiently frequent and complete to give him a season of unalloyed happiness. He has favored us with another "test," which will be found in the appropriate column, and which will be valuable and interesting reading to telegraphers and electricians. The constant and protracted soaking the lines have had during the month just closed has severely tested the different styles of insulation in actual use, and some contributions on this subject from the telegraphic brethren are now in order.

The rivers in the south and west are up, and the streams in all directions are filled to the highest high water mark, and, in many cases, even beyond it; and the telegraphs, especially in the south, have suffered very severely from this cause. It is to be hoped that JUPITER PLUVIUS will soon "let up" on us, or we shall need NOAH'S old tub to save a remnant of the great American people.

One extreme follows another—"man never is but always to be blest"—and in a few weeks we shall all be complaining because it is so hot and—dry. Atmospheric electricity will then be playing mischief with the telegraph wires, instruments, offices and operators, and there need be no fear that we shall be deprived of opportunities for dissatisfaction and grumbling.

A Sad Affliction.

WE regret to learn that President ORTON, of the Western Union Telegraph Company, whose departure for Europe, in hopes of obtaining improved health and recovery from nervous and physical prostration, caused by the excessive labor and responsibility of his official position, we recently recorded, has met with a very severe affliction. His youngest son Samuel, about three and a half years old, was taken with scarlet fever, which terminated fatally.

It was understood that Mr. ORTON'S health had been somewhat benefited by the trip, although he was not in a condition to undertake much labor, either physical or mental. Mrs. ORTON suffered so severely on the outward trip that it was feared she would not survive it, had it continued even a short time longer.

They intended to have gone to London, and from thence to Paris, but the sad affliction which has befallen them will prevent carrying out the plan. It is understood that they will immediately return to the United States.

Mr. ORTON and his family will have the kindly sympathy of all telegraphers in this affliction, which is the more severe, coming as it does when he is so ill-able, physically, to endure it. We trust that he may return in better physical condition than the latest advices from him indicated.

Agents for The Telegrapher.

OWING to the pressure upon our columns we have been obliged, for some time past, to omit the publication of the list of Agents of THE TELEGRAPHER, but, in fact, no special announcement or authorization is required. As the subscription is paid in advance, any person can act as agent and solicit and forward subscriptions to the paper.

In addition to the friends of THE TELEGRAPHER in Canada, who have kindly aided in extending its circulation heretofore, Mr. C. W. HURLBERT, of the Montreal Telegraph Company at Collingwood, Ontario, will act as agent, and subscriptions may be made through him.

Mr. GEORGE L. SPARKS, of the Pennsylvania Telegraphic Agency at Waverley Heights, Pennsylvania, will also receive and forward subscriptions.

We commend these and all others who may interest themselves in obtaining subscriptions to the favor of the fraternity, and hope that we may receive a material addition to our list through their efforts.

We allow to those who may interest themselves in obtaining subscriptions, who desire it, a commission of 20 per cent. on the amount collected, to defray expenses, etc., for postage, and in lieu of club rates.

The dull season is at hand, and special effort will be required to continue the increase of subscribers, and we hope that every friend of an independent American telegraphic journal will bear this in mind, and give to THE TELEGRAPHER the benefit of their exertions in its behalf. The success of the paper has been very flattering and creditable to the telegraphers of this country. Let no effort to make this success more marked be spared. We are trying to make the paper a good one, and have reason to believe that in this we have not been entirely unsuccessful. It should be read and paid for by every person interested in telegraphic pursuits.

Specimen copies will be furnished to individuals or canvassers gratuitously upon application.

The Telegrapher.
By Cable.

THE UNITED STATES DIRECT CABLE BEING SHIPPED.

LONDON, April 25.—The new cable steamship Faraday has commenced to load the new Atlantic cable, of the United States Direct Cable Company, which is to be laid to Rye Beach, New Hampshire, via Nova Scotia.

Interruption of the Cuba Cable of 1873.

RECENTLY the Cable from Key West, Florida, to Havana, Cuba, of the I. O. C. Telegraph Company, which was laid in 1873, failed. The tests made show the location of the fault as about 12 miles from Havana.

Mr. George B. Prescott, the electrician to the company, and Mr. William Mackintosh, foreman of repairs, sailed for Key West two weeks since to under-run the cable and repair the difficulty, but, at the last advices, had been unable to accomplish anything owing to the unfavorable condition of the weather.

By direction of the Secretary of the Navy, Admiral Scott placed one of the vessels attached to the Gulf Squadron at the service of the company, and on the 25th ult. an attempt was made by Mr. Prescott to underrun the cable, but on account of a gale coming up the party were obliged to abandon the effort for the time and return to Key West. The old cable is still working, however, and the transmission of business is not interrupted.

The New Philadelphia Office of the Philadelphia, Reading and Pottsville Telegraph Co.

THE main office of the Philadelphia, Reading and Pottsville Telegraph Company, at Philadelphia, has been removed from the corner of Third and Chestnut streets to the National Fire Insurance building, No. 204 South Fourth street, a central and eligible situation.

The first floor of the building has been handsomely fitted up, at considerable expense for the occupation of the company. A fine walnut counter extends along the front of the room for the accommodation of the customers and clerks, which presents a neat and tasteful appearance. The partitions, desks, tables, etc., are all of heavy walnut, and the new office is one of the neatest and best arranged of its kind in the city. The

tables for the operators are of the well-known and favorite Western Union pattern, each table having four instruments.

The office connections and wires are run in a cable from the line wires at the window to the Switch board, and from the Switch board to the instruments making a really handsome appearance.

This company is doing an excellent business, its wires extending along the entire length of the Philadelphia and Reading Railroad, and through connections with the Franklin and other lines, business is transmitted to all parts of the country.

There is also a local telegraph having thirty-one stations in different parts of the city, including Germantown, Frankford and Manayunk.

Mr. C. T. Sellers is the Superintendent, and Mr. H. W. Spang Asst. Supt. of this company, their headquarters being at Reading, Pa. Mr. O. W. Stager, who has been in the employ of the company for several years, and who is an able and experienced telegrapher and manager, is its manager in Philadelphia. The company, the public, and the manager and his subordinates are to be congratulated at having at length secured adequate and comfortable accommodations for their large and increasing business.

GALVANOMETRICAL MEASUREMENT OF INSULATORS

At the BROOKS INSULATOR WORKS, Philadelphia, April 25th, 1874, in Rain.

Constant of Galvanometer 4,200 through a million of units, with 100 cells Calland.

Description and Number of Insulators.	Date of Exposure.	Deflection by Insulator.	Resistance in Siemens Units.	Date of First Measurement in Rain.	Resistance in Siemens Units.
10 Porcelain (French Administration Standard)	Mar. 1, 1868	21	100,000,000	Apr. 7, 1868	No deflection.
10 Western Union Glass, with painted brackets.	" "	350	12,000,000	" "	83,000,000
10 West. Union new style (the wire at top)....	" " 1872	300	14,000,000	Mar. 10, 1872	116,000,000
20 Kenosha on Brackets....	Nov. 1, 1872	350	12,000,000	Nov. 6, 1872	2,300,000,000
10 Brooks in cross arm....	Mar. 1, 1868	1	4,200,000,000	Apr. 7, 1868	No deflection.

The foregoing table gives the resistance of the insulators when first exposed, and also extent to which their insulating properties have been reduced by exposure.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

APRIL.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
23.....	68½ 71¼	.....	.....
24.....	68 71¼	.....	56½ 56½
25.....	70½ 72	.....	57 57
27.....	70½ 73	.....	.....
28.....	72½ 74½	.....	54 55
29.....	73½ 75½	.....	54

Foreign Telegraphic Notes.

THE receipts of the Submarine Telegraph Company for the month of March, 1874, amount to £9,000 against £8,447 for the corresponding month of last year.

ADVICES from Panama of April 16, state that it was officially announced there that the Cuban Cable was repaired, and that direct communication had been established between the Isthmus and New York, a message requiring only a few hours for transmission, but up to that date there had been no actual proof of the truth of the assertion. Telegraphic dispatches which should have arrived on the 8th had not yet come to hand.

KINGSTON, Jamaica, advices state that cable communication is reopened between the West Indies and the United States, as also Central and South America, so that communication is direct and prompt.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended March 17, 1874, and bearing that date.

148,667.—ELECTROLYTIC APPARATUS.—Evans Casselberry, St. Louis, Mo., and Nathan H. Edgerton, Philadelphia, Pa. Application filed April 19, 1873.

The terminal points or electrodes within the liquid are increased until a path is furnished, the current to the point of action having a minimum of resistance, thus utilizing the greatest amount possible for electrolysis.

The apparatus for electrical decomposition, consisting of a decomposing tank or receptacle and the bifurcated or divided conductors within such receptacles, substantially as and for the purpose described.

148,768.—PRINTING TELEGRAPH.—John E. Smith, New York, N. Y. Application filed August 23, 1872.

Unison stop. Improvement on stop in patent 127,111. Unbalanced stop lever J, loose on shaft, moves by gravity to engage pin on type escapement wheel, and is released therefrom by blow from lever O, pawl n and ratchet preventing recoil. Index affixed to show proper adjustment of spring of escapement lever.

1. The combination of the gravitating or unbalanced unison lever J, the pawl n, the ratchet wheel I, of the train of gear connected with the type and escapement wheels, the pin m, the armature lever O and the magnet H', substantially as and for the purposes herein set forth.

2. The combination of the index V, the scale W, the pulley T and the belt U with the adjuster R and spring S of the escapement pallet G, essentially as and for the purpose specified.

For the week ended March 24, 1874, and bearing that date.

No. 148,833—FIRE ALARM TELEGRAPH APPARATUS.—John F. Kirby, Boston, assignor to himself and Frederick William Nichols, Lynn, Mass. Application filed December 31, 1873.

Adjoining signal box is a closet, into which a person desiring to give an alarm, and not having a key to open the box with, enters, closes, and throws a bolt which passes into the signal box, starting it, at the same time locking himself in for a time, so that he may be detained until the correctness of the alarm be ascertained.

In combination with a signal box, a door attached to a suitable closet, and provided with a mechanism for locking such door from the inside, and at the same time operating the signal box, and a mechanism for preventing the closet from being opened until the expiration of a predetermined time, substantially as and for the purpose set forth.

148,910—COMPOSITION FOR COATING TELEGRAPH WIRES.—Alexander Wilkinson, London, England. Application filed February 20, 1874.

A preserving compound for telegraph and other electric wires, composed of white lead, pitch (or rosin or tar), japan, shellac or its equivalent, tallow, naphtha and oil, in or about the quantities specified, and capable of being applied either directly to such wire or wires, or by application to any fibrous or textile material covering said wire or wires, or by saturating such fibrous or textile material previous to enveloping the wire or wires, substantially in the manner and for the purposes specified.

148,938—FAC-SIMILE TELEGRAPH.—Francis De Houdt, Chicago, Ill. Application filed July 15, 1873.

Clock work revolving, transmitting, and receiving cylinders controlled by a verge attached to a polarized armature. To shaft carrying escape-pin taking into verge is fixed a mechanical pole changer; gives an intermittent rotary motion to the cylinders, but secures their unison. Message written in insulating ink on foil. While stylus travels over foil, a short circuit is made, which is broken by insulating ink, sending current over line.

1. The combination of an electro-magnet having a vibrating polarized armature, fitted with a verge and a mechanical pole changer, operated by a train of wheel work, the verge vibrating clear of the wheel work when the circuit through the magnet is unbroken, but when the circuit is broken the wheel work is arrested at half a revolution of the shaft thereof, substantially as and for the purposes set forth.

2. The combination, with a single train of wheel work, of an electric circuit, which governs the escape of the train, and a transmitting or message writing mechanism, operated by the same single train, substantially as specified.

3. In an electric chemical copying telegraph, the two independent circuits, one to govern the motion of the mechanism, and the other to produce the chemical effect, in combination with the transmitting and receiving mechanisms, substantially as specified.

4. The cam-shaft A'a, actuated by the trains to vibrate the lever c, carrying the battery terminals e, the adjustable sleeve f, fitted with projections g, and the verge lever D, vibrated by the armature C of the magnet B, combined, arranged, and operated substantially as specified.

5. In combination with the arm or style lever G and screw m, the jointed nut h, substantially as and for the purpose specified.

148,946—PRINTING TELEGRAPH.—Merritt Gally, Rochester, N. Y. Application filed February 23, 1874.

Reciprocating sending key, transmitting both for code and printing receivers simultaneously. Balanced frictional escapement key ping motor uniform.

1. In a telegraphic manipulator or transmitter, the combination of an index and a reciprocating key, substantially as set forth.

2. The combination, with a reciprocating transmitter, of a reversible index, substantially as specified.

3. A transmitter having two keys or sets of keys, each key or set of keys representing the same characters as the other, and capable of being operated for alternate transmission, substantially as specified.

4. The combination, in a telegraphic transmitter, of varying groups of conductors, and a single key with a series of contact points, the depression of the key at any letter of a provided in-

dex producing the proper contacts for causing the representation of that letter.

5. The combination, with a single key in a telegraphic transmitter, of varying groups of conductors for signal or code transmission, and additional sets of conductors for transmitting to dial or printing instruments, substantially as specified.

6. The combination, with a type wheel, of rack and gear C⁴ and a reciprocating key, substantially as set forth.

7. A printing mechanism having a movement for placing the position of the lines at the end of each line printed, instead of moving the material to be printed upon, substantially as specified.

8. The combination, with key D², or equivalent, having conductors for dot and dash alphabet, of a printing copier which is operated directly or indirectly by the transmitting manipulation, or in connection therewith, substantially as set forth.

9. A type wheel with two parallel faces, either of which may be used by rocking the wheel from side to side upon its centre of revolution, substantially as specified.

10. The combination, with a circuit closer for transmitting or receiving through the main line, of the local circuit R L, which is thereby mechanically kept in unison with the transmitting pulsations, substantially as specified.

11. The combination of adjustable devices, whereby the stopping of any of the parts propelled by the motor secures a uniform tension upon the motor, and therefore a uniform velocity, substantially as specified.

12. The adjustable stop lever M, or equivalent, substantially as and for the purpose specified.

13. The winch T, with conducting and non-conducting bearings for safety circuit, substantially as specified.

148,956—MAGNETIC TELEGRAPH APPARATUS FOR STUDENTS' USE.—William Humans, Cambridge, Mass. Application filed February 7, 1874.

Permanent magnet pivoted and depressed by a key until its other end is brought sufficiently near the sounding part to attract the same.

In a magnetic sounder, the combination of spring key e, a lever, b, a lever, i, with its bar h and spring m, and lever stops n o, the bar h or lever b being a steel magnet (or both being steel magnets), and the construction and operation being substantially as described.

Born.

LYON.—At Newark, N. J. April 21st, to FRANK G. LYON, of the Gold and Stock Telegraph Co., New York, a son.

Married.

WHEELER—NEALLEY.—At Salem, Oregon, April 9, by the Rev. S. C. Adams, Mr. A. F. WHEELER, Manager of the Western Union Telegraph, in that city, to Miss LAURA NEALLEY of Dallas, Oregon.

The matrimonial epidemic seems to carry off the Oregon telegraphers very rapidly, and a fresh importation of telegraphic bachelors will be required to keep up the supply. The last happy man is a good fellow, and deserves his good fortune. His few remaining unmarried telegraphic associates offer him and his bride their sincere congratulations, and will imitate his example at an early day.

Died.

ORTON.—On Sunday evening, April 26, of scarlet fever, SAMUEL VANCE, youngest child of William and Agnes Orton, age 3 years and 6 months.

GEO. W. RICHARDS.

WM. BEALE HALE, Late First Assistant Examiner of Electrical and Telegraphic Apparatus, U. S. Patent office.

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SOLICITORS OF UNITED STATES

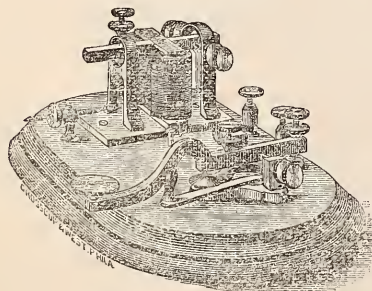
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THE

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A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"

"History of America," "Civil War in America;" Member

of many Scientific and Learned Societies of Europe

and America; Commander of the Order of Dan-

nebrog, Denmark; Order of St. Olaf,

Norway, and of the Sword Order,

Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Mnschonbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Crnikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Oersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, scaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinhell, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

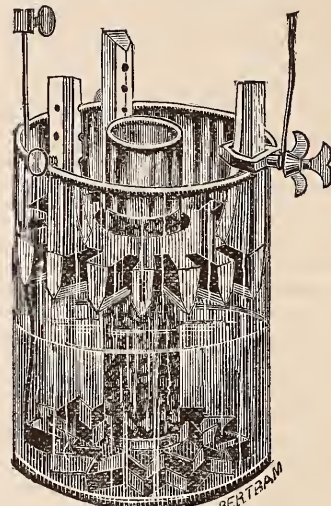
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It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

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for Students and Amateurs.

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We are now prepared to furnish these unrivalled Amateur Instruments, with or without Office Outfits, in any quantity and at a moment's notice. Our Agents may now send in their orders as rapidly as they please, and can rely upon their being promptly executed. Prices as heretofore.

Instrument complete, Key and Sounder..... \$6 50

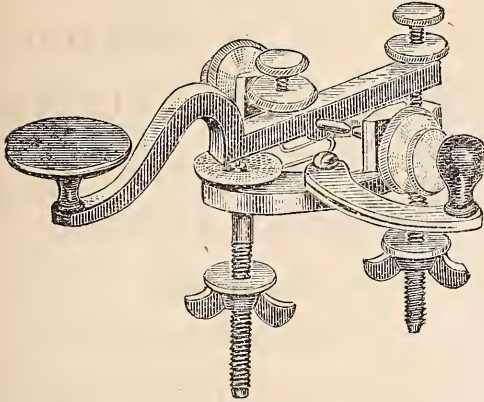
Instrument with Office Outfit..... 7 50

Two Instruments and Outfits..... 14 50

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8 Dey Street, New York.

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PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.

Acknowledged to be a decided improvement.
Price, same as the ordinary key.

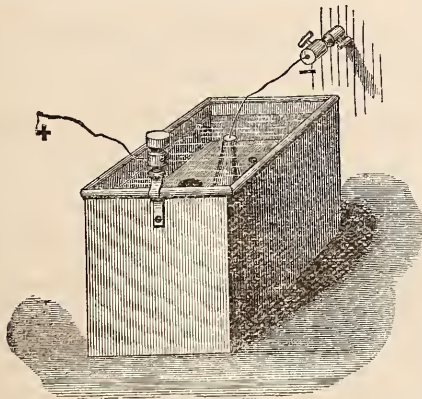
Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
- RELAY, SOUNDER and KEY on same base, making an elegant set.
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- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

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- SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

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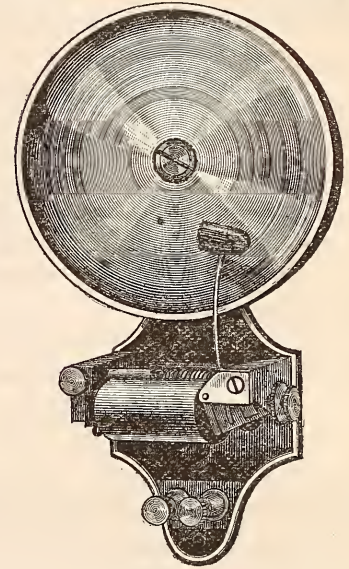
- SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.
Bliss' Manual and Price List furnished free on application.

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Manufacturer of
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132 WILLIAM STREET (rear),
Between Fulton and John Streets, NEW YORK.



One half of actual size
ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

- The Platina Points are large and hard.
- Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight, \$50 00
- Sounders, from..... 4 50 to \$6 50
- Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00
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MANUFACTURERS AND DEALERS IN

Electrical and Telegraph Instruments.

A FULL ASSORTMENT OF TELEGRAPH INSTRUMENTS
CONSTANTLY ON HAND.

Telegraph, Magnet, Office, and other Insulated Wires,
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PATENT ELECTRIC WATCH-CLOCK

THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection
MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS

AND PRICES EXTREMELY LOW.

SEND FOR PRICE LIST.

TILLOTSON'S POCKET INSTRUMENTS,

IN HARD RUBBER CASES,
NEATNESS, COMPACTNESS and UTILITY COMBINED.

Will work on circuits of any length.

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8 DEY STREET, NEW YORK.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
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Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
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Lynn, Mass.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THESE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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TELEGRAPH ENGINEER,

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INSTRUMENTS,

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BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**, with Patent Platina Connection, introduced by us eight years since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single **DANIELL** cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made

Our **CATALOGUE**, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.
This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.
This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
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Insulated Conductors.
These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.
Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved, and superior
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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES
constructed in the best and most substantial manner, and on reasonable terms.
Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer.
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COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over 15 per cent. the number of poles and insulators required.
Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.
And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring
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This Instrument is offered to the public as the oldest, most rapid, and best.
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It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up
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which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS
of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES
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EVERY DESCRIPTION,
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NEW AND SUPERIOR PATTERNS OF
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These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

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In addition to these, we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.
Sole Agents for the
EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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REDUCTION OF PRICES.

POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL

TELEGRAPH APPARATUS,
For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, nearly 2,000 have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates: Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50. Two sets of Instruments, etc..... 12 00

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CHAMPION LEARNERS' APPARATUS,
with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,
Improved Curved Keys,
Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

DR. L. BRADLEY,
No. 9 Exchange Place,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat. As they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals, and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a hauled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instrument.

Price of apparatus complete, is \$200 to \$300, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his
CELEBRATED HELICES

WHICH ARE OF
Naked Copper Wire,

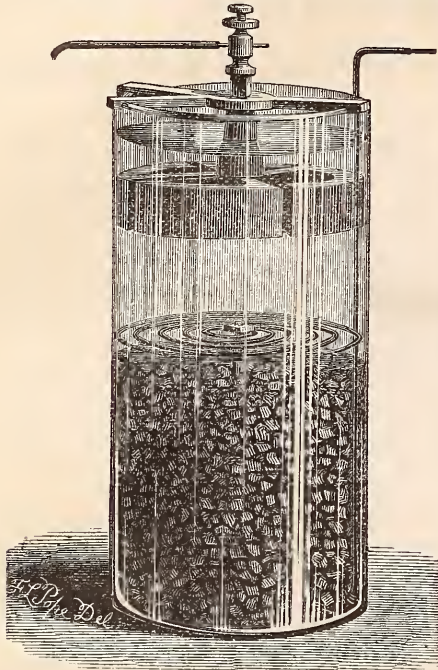
So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

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THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

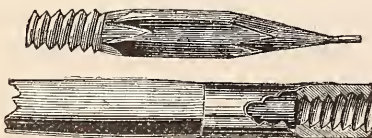
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

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41 Third ave., Chicago, Ill.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

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TELEGRAPH, WIRES, INSTRUMENTS,
BATTERIES, TOOLS,
INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND

UNION BRAND EXTRA QUALITY.

JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

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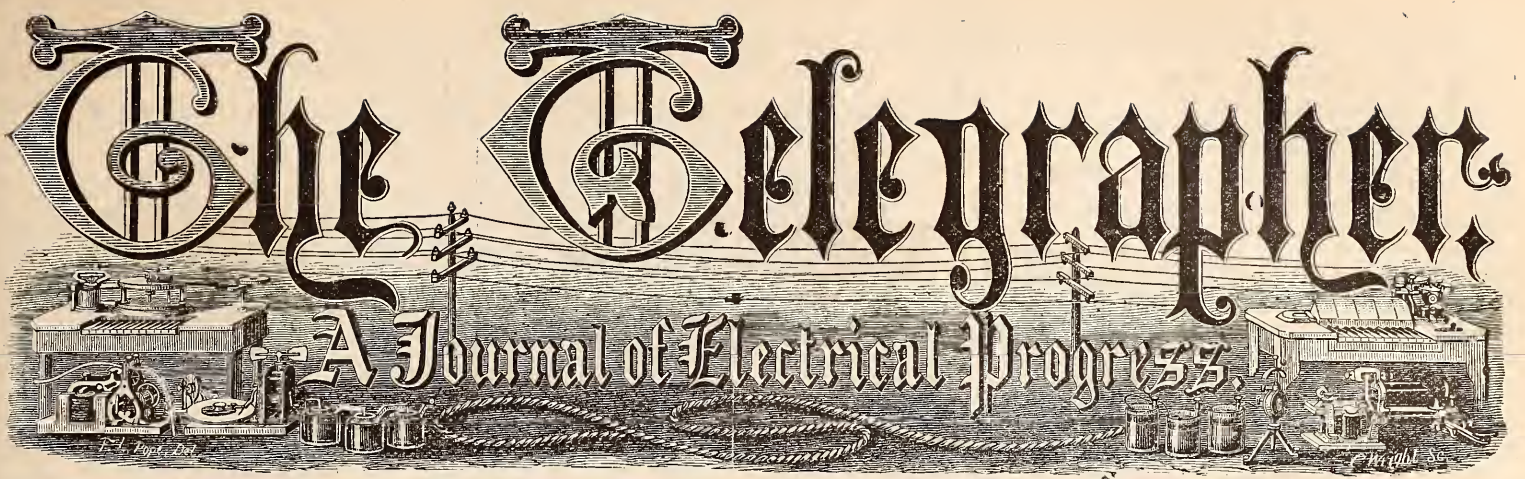
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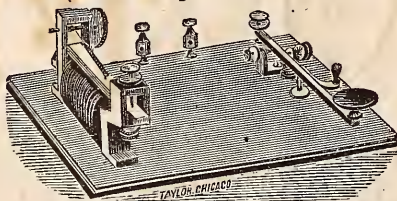
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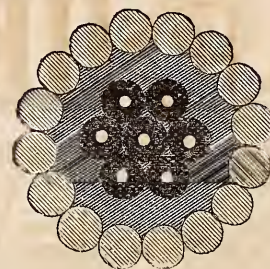
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MAY 9, 1874.

VOL. X. WHOLE No. 408.

The Historical Department of the German Telegraph Exhibition at Vienna in 1873.*

(Concluded from page 55.)

HAVING thus noticed the various groups of telegraphs in the stricter sense of the term, there remain those apparatuses which belong (almost independently of the choice of a particular telegraph) to the completion and equipping of stations; and, after glancing at these, we may briefly refer to the sources of electricity and the telegraph lines. Before doing so, however, a few words about automatic quick writers.

So long as, in telegraphy, the sending of a current is in the hands of a clerk, the regularity and correctness of the signs, as also the rapidity of signalling, must depend on the expertness and practice of the operator; whereas, a machine adapted for sending of currents would work quite regularly and with a rapidity which would find its limit only in the capability of the line to receive currents. The pointer telegraphs are mostly furnished with automatic transmitters: in the Morse writing, on the other hand, manual work still preponderates, and the historical department contains a rich collection of Morse keys, from one of the year 1850 down to the key now commonly used since 1871; also Siemens' key for induction currents (1855), his submarine key (1857), and various keys with change of battery. Morse attempted an automatic transmission of current even in his first telegraph, causing the telegrams, represented by a succession of long and short metallic pieces (types) fixed in a plate, to pass under a contact lever, which, on being raised by the types, closed the circuit. But this arrangement cost too much time, and the electro-magnets did not follow with sufficient quickness and certainty. Thereafter Bain (1846) cut out the Morse points and lines with a sort of pincers in a strip of paper, which was then wound round a metallic cylinder connected with the battery, while a spring or roller connected with the circuit came into contact with the metal at the perforated parts, and by this means the Morse writing was reproduced, electro-chemically, at the receiving station. In 1852 this mode of telegraphy was in use some time between Liverpool and Manchester. More successful had Siemens been with his quick writer (already noticed), which was constructed at first for the Russian state telegraph lines; and which, like his relay apparatus, possesses oscillating magnets. Besides these two apparatuses, there is exhibited the perforator, with three keys, for piercing the strips, and the signalling instrument, in which a steel style passes through the holes of the strip. From 1856 Siemens and Halske endeavored to solve the problem more thoroughly, by means of magneto-electric induction currents, in a permanent polarized electro-magnet system, and they supplied (1857) the Sardinia-Malta-Corfu line with such apparatus. The most recent progress in the Siemens quick writers for perforated paper strips, as used on the India lines made in 1868, is shown in the equipment of one line. The perforating key pierces the strip, which is carried by a small roller furnished with a series of guiding holes, and at the other end of the line a polarized ink writer is attached as a receiving apparatus. If magneto-induction currents are used in place of battery currents, the signalling instrument arranged for the purpose allows only the currents required for the Morse signals to pass into the line. Meanwhile, Siemens had tried another way with the type quick writer patented in 1862; types which represented entire Morse letters (later only lines, points, and intervals) were set in a frame and passed under a contact lever, the alternating currents (at first magneto-induction, afterwards galvanic) being thus sent through the line to a polarized ink writer at the receiving station. The type setting and distributing machine constructed by Siemens is unfortunately not exhibited. It is still more to be regretted that the Wheatstone automatic apparatus, patented in 1858 (and employing also perforated strips) along with its ingenious transmitting instrument for alternating currents, and especially its most recent arrangement for compensating currents, has not been shown. The three newest quick writers appear in Siemens and Halske's collections; in all three the pre-

paring apparatus is connected with the writer proper; they are furnished with finger-boards, and require neither types nor a perforated strip. Siemens' quick writer gives Steinheil writing; that of Hefner-Alteneck (1872) Morse writing. The quick printer (of Siemens, 1873) prints the telegram in type, writing much more quickly than Hughes'; there is a type-wheel, which, through two escapements, is brought back to the nil point after each impression, while opposite currents of equal duration are used, which have proved so especially serviceable in submarine lines.

The historical exhibition has a rich collection of relays of various construction. Near the oldest of them (1849), with straight armature-lever, are shown the Hanoverian (1850) with bent lever, the Siemens' box relay (1851), and a whole series of the most various polarised relays; the relays of Notteholm and Borggreve (both of 1857, with horizontal electro-magnet); a relay with electro-magnetic core, which can be varied according to the strength of current; and Siemens' relay with two electro-magnets and two armatures for translation in lines, with alternating currents.

There is also no lack of alarums. To the oldest (Sömmerings') are added—Schilling's apparatuses, the Kramer alarm for intermediate stations (1849), Siemens' intermediate alarm (1850), and the post alarums of Borggreve (1857) for currents of determine direction.

It is to be regretted that the history of the origin of translators is not clearly shown in the exhibition, and especially that the oldest Siemens' translator for pointer telegraphs, and the oldest Morse translators are absent.

A large number of lightning discharges are exhibited; the oldest of these (that of Steinheil's, 1846, being absent) is a plate discharger of Siemens' employed in 1848 between Eisenach and Frankfurt, and consisting of three plates, the middle one connected with the earth. Then follow, in order of age, four of those used by Siemens in the years 1850 to 1853; the wire-roll lightning discharger; the wire discharger with metallic support; the point discharger, in which there are plates opposite the metallic points, and the ball and point discharger, whose plates end above in balls, while each point stands opposite another. After Siemens' vacuum discharges (1852) come the Notteholm separating dischargers in the forms used before and after 1857; while the point dischargers, similar to these, are not exhibited. Lastly, we have the recent plate dischargers of Elsasser (1866 and 1869). There is also a discharger especially meant for telegraph lines, consisting of two metallic cylinders, one inserted in the other; the bottom being separated by a piece of wood (which has been boiled in oil) three centimetres thick.

Among commutators one misses the old clamp-commutator. Along with the bar commutator used since 1854, are shown three peg commutators of Notteholm, as these were used till 1857, and a series of peg and bar commutators by Borggreve and others, still in use, for the various branches of telegraph service—among others the testing commutator of Elsasser (1866).

Of rheostats or resistances there are only exhibited a mile resistance, in box form, by Siemens, in 1854; a bar rheostat with resistances of one to fifty miles of iron wire 2.1 lines in diameter (1857), and the graphite resistances used since 1865, at intermediate stations, for regulation of the line resistances. The latter consists of powdered graphite pressed in glass tubes, and giving a resistance of 500 to 2,500 Siemens' units.

Galvanoscopes are exhibited only in their most recent forms, viz., those in use since 1869 and 1871 (after Varley, 1857), and the hair needle galvanoscope of Siemens (1869).

As sources of electricity in telegraphy either galvanic batteries or inductors may be used. Of batteries, the historical department shows only that of Siemens (1849), with zinc copper elements. Recent batteries have been exhibited by various German, Austrian and French makers in their respective departments. Of inductors may be noticed, besides the Steinheil and Stöhrer apparatuses, the magneto-inductor, with twenty-eight pairs of lamellæ, which Siemens constructed in 1850 for alarm apparatuses; the magneto-inductor of Siemens (1850) for blasting charges in mines through glowing steel wires; and two electric inductors of Siemens (1855), one of which, with few elements, produces induction currents of the second order, changes them into currents with the same direction, and utilizes them in Morse writing in long lines; while the other produces Morse writing with alternating currents and polarized relays.

Along the walls of the hall before the Annexé, there are inserted a number of wooden and iron posts, on which may be studied the various constructions of overland telegraph lines. Sometimes we have simple posts, sometimes double stands, double rods, and they bear various kinds of insulators. Several of these posts show the arrangements for tightening the lines. Other posts exhibit the passage of an overland line into an underground; and a tunnel box shows the connection of the cable passing through the tunnel with the overland lines. Lastly, there are shown connections of lines at the stations; both the older (to 1867); and the

more recent. This part is supplemented by some Bavarian rods and wire connections in the Annexé itself, and here also are the various tools and testing galvanometers, etc., used in examination of overland and underground lines. Iron telegraph posts of the newest kind are exhibited by France in the Gallery, 5B, and by Siemens and Halske, in Gallery 8A of the Palace of Industry. The historical department contains no underground or submarine lines; but quite in the neighborhood are to be seen the cable tests of Felten and Guillaume, in Cologne, and of Siemens and Halske from the factory at Woolwich. On the other hand, the department contains an exhibit with which we will here close our survey (merely glancing at the interesting maps which show the development of the German Telegraphic System in the years 1854, 1860, and 1866, 1872, and also a table which graphically represents the development of telegraph traffic and its means in Germany, from 1854 to 1872). This is the first gutta-percha press for furnishing lines with a sheath of gutta-percha without suture; it is constructed in model by Siemens, and was handed over by him to Fonrobert and Pruckner, in Berlin. With machines formed after this model were furnished the cables for the underground lines laid in Germany and Russia, from 1847 to 1851, and they are now used for the covering of all submarine lines.

Hooper's Telegraph Works.

A MEETING was held on the 15th of April on board the cable steamship Hooper, in Millwall Docks, prior to the departure of that vessel on her third voyage to the Brazils, for the purpose of laying the section of cable between Para and the West Indies, and, in connection with the West India and Panama Telegraph Company's system, to connect the Empire of Brazil with the United States. Mr. Dunlop, chairman of Hooper's Telegraph Works, presided on the occasion, and in proposing continued success to the Hooper on her present voyage, referred to the very satisfactory condition of the cables already laid for the Western and Brazilian Telegraph Company—a statement confirmed by Mr. Heugh, chairman of the company. Mr. Earle, managing director of the West India and Panama Company, referred to arrangements in course of completion between his company and the company for whom the cable now on board the Hooper has been made, and, although previously associated with rival companies, he was glad to be afforded the opportunity of testifying to the skill displayed in the present arrangements for the manufacture and laying of the cable by Hooper's Company. Mr. Weaver and Mr. Andrews, other directors of the West India and Panama Company; Mr. Orton, President of the Western Union Telegraph Company, of New York; Mr. Chaytor, director of the Brazilian Submarine Telegraph Company; Mr. Erichsen, representing the Great Northern Telegraph Company; Mr. Madsen, under whose inspection the cables for the Great Northern Telegraph Company were manufactured; Major Bateman Champain; Major Stiffe; Mr. Preece, of the Telegraph Department of the Post-office; Sir Samuel Canning, Mr. H. C. Forde, Mr. C. Seymour Grenfell, Mr. Bramley Moore, Mr. Bessemer, Captain Pender, Captain Hull, Mr. Blakeney, and Mr. Snelling, of the Hydrographic Department of the Admiralty, were also present. Major Bateman Champain, in reply to the toast proposing his health, had much pleasure in saying how excellently the cables supplied by Mr. Hooper, and submerged in the Persian Gulf and between Ceylon and India in 1865 and 1868, still continue to act. The healths of Mr. Dunlop and Mr. Hooper (the managing director) were severally proposed and responded to.

First Report of the British Association Committee on Dynamical and Electrical Units.

THE first report of this Committee was made at the recent meeting of the British Association for the Advancement of Science, and is confined principally to the selection and nomenclature of units of force and energy, under which head the Committee is itself prepared to offer certain definite recommendations, which are as follows: 1st. The gramme, centimetre, and second are recommended as the units of mass, length and time, respectively; a combination which has the advantage of making the unit of mass appear identical with the mass of the unit volume of water—in other words, of making the value of the density of water appear equal to unity. From these fundamental units the units of electrical and magnetic magnitudes, now in common use, may be derived; and it is recommended that, until special names shall be prepared for them, they be distinguished from absolute units, otherwise derived, by the three initial letters, C. G. S. As regards the name to be given to the C. G. S. unit of force, it is recommended that it be a derivative of the Greek word *dynamis*—the form *dynamy* appears to be the most satisfactory to etymologists. The work done by this force working through a centimetre is the C. G. S. unit of work, for which is proposed a name derived from

* Abstract of a paper by Dr. Zetzsche in the *Internationale Ausstellungszehnung*.

the Greek *erg.*; the C. G. S. unit of power is the power of doing work at the rate of one *erg.* per second, and the power of an engine can be specified in *ergs* per second. The common and extremely variable unit of one horse power is about three fourths of an *erg.* per second. For the expression of high decimal multiples and sub-multiples the system introduced by Mr. Stoney is recommended. It consists in denoting the exponent of the power of ten which serves as a multiplier, by an appended cardinal number if the exponent be positive, and by a prefixed ordinal number when the exponent is negative; thus ten to the ninth power, or one thousand million grammes, constitutes a "gramme-nine," and the one thousand millionth of a gramme constitutes a "ninth gramme."

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF ASSESSMENTS 58, 59 AND 60, UP TO AND INCLUDING APRIL 20, 1874.

4, 5, 6, 13, 23, 26, 28, 33, 55, 58, 65, 70, 72, 74, 75, 80, 89, 93, 97, 101, 103, 108, 114, 120, 122, 131, 140, 141, 142, 144, 146, 148, 153, 171, 175, 179, 183, 189, 190, 191, 193, 197, 198, 215, 227, 230, 235, 240, 247, 248, 274, 303, 342, 344, 351, 360, 372, 380, 391, 392, 393, 402, 405, 413, 430, 431, 441, 466, 468, 469, 470, 471, 475, 476, 484, 511, 512, 514, 516, 553, 554, 556, 560, 561, 573, 575, 584, 590, 604, 618, 622, 642, 646, 648, 649, 662, 663, 664, 665, 669, 685, 694, 701, 708, 714, 729, 735, 737, 741, 750, 751, 756, 764, 769, 790, 803, 808, 809, 812, 820, 830, 831, 848, 855, 871, 873, 883, 901, 905, 922, 927, 930, 931, 939, 941, 943, 952, 976, 978, 980, 991, 992, 998, 1000, 1002, 1005, 1028, 1040, 1047, 1058, 1074, 1075, 1076, 1080, 1093, 1100, 1101, 1102, 1127, 1147, 1149, 1152, 1154, 1155, 1156, 1157, 1159, 1160, 1162, 1167, 1185, 1191, 1196, 1210, 1217, 1224, 1232, 1233, 1241, 1255, 1266, 1274, 1276, 1277, 1282, 1288, 1304, 1107, 1308, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1318, 1319, 1320, 1321, 1322, 1339, 1340, 1342, 1344, 1345, 1346, 1348, 1349, 1350, 1351, 1352, 1358, 1366, 1372, 1375, 1385, 1387, 1389, 1390, 1391, 1415, 1417, 1418, 1421, 1427, 1431, 1437, 1438, 1449, 1457, 1458, 1470, 1481, 1483, 1484, 1485, 1497, 1500, 1501, 1503, 1508, 1511, 1513, 1515, 1524, 1527, 1537, 1546, 1552, 1554, 1555, 1563, 1564, 1569, 1573, 1576, 1580, 1582, 1586, 1591, 1593, 1594, 1596, 1620, 1623, 1625, 1630, 1632, 1644, 1650, 1652, 1666, 1672, 1707, 1714, 1718, 1719, 1720, 1721, 1729, 1730, 1732, 1737, 1785, 1791, 1794, 1795, 1796, 1797, 1799, 1802, 1804, 1815, 1818, 1823, 1824, 1847, 1852, 1863, 1864, 1881, 1900, 1901, 1903, 1921, 1922, 1924, 1926, 1943, 1951, 1957, 1994, 1996, 1997, 2004, 2015, 2022, 2024, 2025, 2026, 2033, 2040, 1057, 2065, 2074, 2075, 2077, 2083, 2084, 2089, 2094, 2101, 2106, 2112, 2113, 2114, 2116, 2119, 2123, 2125, 2134, 2136, 2137, 2138, 2141, 2142, 2143, 2144, 2147, 2148, 2152, 2154, 2162, 2165, 2170, 2179, 2181, 2180.

ASSESSMENT NO. 61.

4, 6, 16, 52, 53, 54, 55, 64, 74, 86, 88, 113, 131, 175, 188, 208, 211, 230, 277, 289, 303, 383, 385, 426, 434, 478, 509, 564, 626, 661, 721, 722, 812, 825, 917, 1088, 1090, 1148, 1178, 1199, 1266, 1300, 1306, 1357, 1489, 1555, 1568, 1569, 1590, 1742, 1862, 1894, 1951, 2101, 2138, 2162, 2174, 2181, 2190, 2196, 2197, 2201, 2222, 2223, 2224.

ASSESSMENTS NOS. 55, 56 AND 57.

104, 652, 1257, 1600, 1607, 1631, 1642, 1672, 1692, 1699, 1799, 1833, 1835, 1836, 1921, 1922, 1924, 1978, 2015, 2026, 2038, 2101, 2141, 2165, 2170.

MISCELLANEOUS.

53 and 54.—1897.
58 and 59.—2101.
58.—104.—2169.
59.—104.

An Exegesis.
BY OWTON A FLYE.

Oh, the waste of intellect in the world! Doesn't it almost make you skeptical on the point that all is wisely ordered? Great minds victimized by overpowering circumstances? Brains lavished where they can never get out into the broad, charitable sunlight of the world's favor! Look at it! Why, even the profession in which I have the honor to bear the burden of ever so light a part is not without its illustrations of the grand mistake that seems to have been made in the distribution of intellect. I am personally acquainted with at least three persons in our office, at —, who, by virtue of their superior attainments, should be, each in his turn, President of the United States; and I stand ready to take them by the hand when they leave this office. But we can't all be Presidents, and in order to find a place for others, I must drop a little in the scale and call them statesmen, financiers, etc. Of course, these are men who can never become Tip McCloskeys, Jim Lawlesses or Posie Van Dusens in telegraphic circles, but who, no doubt,

would make Daniel Websters and Henry Clays in the political field.

Now, I contend that there is something wrong in the principle that hampers the great minds of nine tenths of the operators of our day, and binds them down to swinging crosses, bad connections, etc. My heart flutters with a little of its old fire, even now, as I think of what I might have been years ago, had it not been that the world, always too slow to recognize true merit, has kept me from my true position, and I am compelled to confine my talent within this aching brow, that almost hursts to belch it to the world. I write this much about myself, because I know I'll find lots of sympathizers in the profession; in fact, to pervert history a little, if I were not an operator, I might be a—river pilot.

However, I did not intend to make this a complainer; I choose rather to look on the bright side of things. We may be happy yet. The Government may take us in hand and then, bless the mark, we will all be politicians. And yet, somehow or other, when I hear the boys dilating on their great capabilities in life and their weak opportunities, it makes me feel bad. Excuse these tears.—*The Switch.*

The New Western Union Telegraph Building.

THE new building in process of erection for the Western Union Telegraph Company, in this city, on the corner of Broadway and Dey street, has reached the seventh story. The front of the structure has been completed to the top of the sixth story, and the interior walls and rear are being put in by the workmen.

In its present state of forwardness an idea can be had of the appearance the building will present when completed. With a front of 75 feet on Broadway and 150 feet on Dey street, it will, when finished, tower above every other business house in the city, except, perhaps, the new *Tribune* building. The height of the structure to the main cornice is 118 feet, and to the top of the pavilion roofs 174 feet. A tower will surmount both the front and rear, the clock tower on the Broadway front reaching an elevation of 226 feet. At the base of the seventh story, the point now reached, a broad stone balcony, with an ornamental iron railing, will run entirely around the building. At the top of the building a tower is to be built, in which will be placed a clock with four faces, each of which will be 11½ feet in diameter, by which strictly accurate time will be kept. It is to be in direct electrical communication with the clock in the National Observatory at Washington, and will be electrically regulated, the proper addition being made for the difference in longitude.

The material of the basement is Quincy granite, and of the first story Richmond granite. Above the first story the materials used are Philadelphia brick, with Richmond granite trimmings. Broad granite bands pass across the base of each story and serve to unite the piers of stone and brick work. The main entrance on Broadway is through a grand portico 20 feet wide and 36 high, faced by two columns and two pilasters of polished, amber spotted Quincy granite. Above the portico is to be a stone balcony on which will stand a statue of Professor Morse. The cellar will contain the batteries; the basement, with an entrance at the corner of the two streets, will be occupied by the company for the receipt and delivery of messages. The first and second stories will be rented, while the third will be devoted to the offices and meeting rooms of the officers of the company. The fourth and fifth stories will be fitted up in offices for rent, accessible by two elevators. The sixth will be devoted to the culinary department, its being found advisable to supply the employés with lunch on the premises. All the stories above the sixth will be devoted to the operating rooms of the company. The main operating room will be 22 feet high, 150 feet long and 60 feet wide.

An American Telegraph Operator Killed by Australian Savages.

By a letter from Castlemaine, Victoria, Australia, of February 25th, information is received of the massacre of an American telegrapher and the serious injury of another operator and a linesman by the blacks. A despatch from Adelaide, to the Australian Associated Press, dated February 23, states—

"The blacks attacked the Barrow's Creek telegraph station at 8 o'clock last night, while all the hands were outside of the station. While trying to get in, the natives speared Mr. Stapleton, the station master; Mr. Flint, an operator; and Frank, one of the linesmen; all of whom were seriously injured, and a native boy, named Frank, was killed. At latest accounts the wounded men were recovering. A strict watch is being kept against fresh attacks at the station, and the men are well protected and armed."

A subsequent despatch, dated on the 24th, conveys the information of the death and burial of Mr. Stapleton, as follows:

"Mr. Stapleton, the station master at Barrow's Creek,

has died from the effects of the injuries he received during the attack on the station last Sunday evening. He was formerly in the Victorian service, under Mr. M'Gowan. He leaves a wife and family.

"Mr. Stapleton was buried to-day, the natives watching the proceedings. Influential committees are being formed to collect subscriptions for the widow and family of the deceased."

The Queensland, Australia, Blacks Attacking A Telegraph Station.

A DESPATCH from Rockhampton, Feb'y 6, to the Australian Associated Press, states that telegrams from the Gilbert River telegraph station report that the station is beleaguered by blacks in great numbers, and the station is barricaded against an assault. The station, which is built of sawn timber shingles, is garrisoned by the telegraph master, his wife, and one assistant. One musket is the only firearm they possess, and it was impossible to hold out long. Two volunteers, in charge of sergeant Griffin, were just leaving for the scene of action, and the police were begging everywhere for the loan of firearms without obtaining any of the right sort. Large crowds of blacks are reported within ten miles of Georgetown.

Demoralized Telegraphers.

Mr. A. MITCHELL, General Superintendent of the Illinois Central Railroad, Chicago, Ill., advertises J. K. Bear, *alias* A. J. Curtis, who, he states, was agent for that road at Waverly, Iowa, and ran away January 23, 1874, stealing \$1,560. His age is about 28 years; is about 5 feet 10½ inches in height; rather narrow between the eyes and across the cheek bones; chin recedes from his mouth; lips rather thick, and projecting; wore heavy moustache of darkest red, which he kept colored; hair dark brown, inclined to be straight; eyes bluish gray; complexion fair, neither dark nor light; medium heavy eyebrows, that run clear across the forehead like one eyebrow; legs rather long; has scar from bullet on left side of his neck just back of ear, looks blue as if it might have been a boil. There are marks of powder under the skin also. When he says "put" he gives it the sound of put in putty; is a good sound telegraph operator, and an expert card player—probably is gambling. Information of his whereabouts is requested by Mr. Mitchell.

Mr. John F. Dickson, General Superintendent of the Texas & Pacific Railway Company, Marshall, Texas, offers \$100 reward for the delivery at that place of H. A. Keeley, late of the M. P. R. R. and H. & St. Jo R. R., or E. T. Coffey, late from Kansas Pacific R. R., who are charged by him with being absconding defaulters. They were employed as agents and operators on the road.

Galvanometrical Measurement of the Resistance of Insulators

At the BROOKS INSULATOR WORKS, Philadelphia, May 5th, 1874, Moderate Rain.
Constant of Galvanometer 4,200 Degrees through 1,000,000 of units, with 100 cells Callaud.

Description and Number of Insulator.	Date of Exposure.	Deflection per Insulator.	Resistance in Siemens Units.	Date of First Arc-Over in Rain.	Resistance in Siemens Units.
10 Porcelain (French Administration Standard)	Mar. 1, 1868	7	600,000,000	Apr. 7, 1868	No deflection.
10 Western Union Glass, with painted brackets.	" "	200	21,000,000	" "	83,000,000
10 West. Union new style (the wire at top).....	" " 1872	200	21,000,000	Mar. 10, 1872	116,000,000
20 Kenosha on Brackets.	Nov. 1, 1872	250	16,800,000	Nov. 6, 1872	2,300,000,000
10 Brooks in cross arm...	Mar. 1, 1868	.5	8,400,000,000	Apr. 7, 1868	No deflection.

The foregoing table gives the resistance of the insulators when first exposed, and also extent to which their insulating properties have been reduced by exposure.

An Efficient and Popular Superintendent.

MR. D. P. SHEPHERD, who has been Superintendent of the Western Union Telegraph Company for the past twelve years, resigned this position a few days since. Mr. Shepherd, had by strict attention to business, uniform courtesy and urbanity of manners, made him a host of friends throughout the State, and by untiring energy built up for his company one of the most remunerative districts in the South. When this gentleman came to Texas there were less than two hundred miles of telegraph line in this State; under his skillful management and foresight no town of over a thousand inhabitants is without its telegraph office, and every hamlet to which a railroad extends is placed in telegraphic communication with the rest of the world. Perhaps no superintendent of the telegraph company more fully possessed the confidence and respect of his employes than did Mr. S., and it should be very gratifying to him to know that, in his retirement, he carries the best wishes and cordial esteem of his late subordinates, all of whom had united in the presentation of a handsome Geneva watch as a slight testimonial of their high regard of so efficient an executive and courteous a gentleman.—*The Dallas (Texas) Daily Herald.*

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

A Plan for Organizing a Telegraphers' Association.

CALIFORNIA, April 26.

TO THE EDITOR OF THE TELEGRAPHER.
I HAVE read with interest the numerous articles and communications which have appeared in THE TELEGRAPHER on the subject of a league or association of telegraphers, and especially a communication asking, "Who shall start it?" I have thought of a plan for establishing on a sure foundation such a league or association, which I would like to make public through the columns of THE TELEGRAPHER, and obtain the views of the fraternity in regard to its practicability and feasibility.

To illustrate my plan, let us suppose a case. We will suppose that the telegraphers in New York, Boston, or any large city, have organized such an association. It will be certain that some of the shysters who play second fiddle to the great Moguls of the companies will very politely inform the employes in his division that if they connect themselves with it they may consider that they are no longer in the employ of the company by whom they are employed. This, it is true, is but a supposition, but such a result is almost sure to follow the action indicated.

Now the plan which I have to suggest to avoid such action on the part of employers, is as follows: Let a time be appointed, and have it known all over the country, that upon a certain designated day every telegrapher in the country is to meet and organize a district of a league or association in his or her town. Let it be thoroughly understood that the telegraphers everywhere must meet some time during the twenty-four hours of the designated day. Then the organization will spring into existence at once.

If there should then be any black sheep (and such are found in every flock), who betray the proposed organization, do not give it up, but be men, and meet and organize anyhow. Then, if the officials should ask if the employes had joined the organization, they could answer, "Yes; and every operator in the country met on the same day, and participated in organizing a district or division in his or her section of the country." In such a case it is not probable that any precipitate antagonistic action would be taken against an organization thus suddenly but fully established; and, upon consideration of the situation, the conclusion would be inevitable that the employes had the best of it this time.

I should be glad to know what the fraternity generally think of this plan.

A Practical Basis for a Telegraphic Association.

TO THE EDITOR OF THE TELEGRAPHER.
I AM opposed to the formation of a Telegraphers' "Union" as they are usually formed. The very name of Union or League invites the suspicion if not actual hostility of proprietors and officers of corporations. Nine out of ten who go into Unions do so to receive benefits without contributing. A few hundred operators by banding together and demanding promotion cannot succeed. The business is too easily acquired to admit of it. First class operators who thoroughly understand their business rarely wait for good situations. Therefore, strength by reason of individual merit will obtain re-

cognition sooner than mere combination of numbers. In order that we may attain this individual merit, I suggest the formation of an order which shall have for its object the classification of operators. I would have it composed of several degrees, and would not give the lowest degree to an operator unless he could alone open a way office, and decently explain the working of the telegraph to a visitor. The next degrees to require advancement in the art. Each degree to have its separate certificate properly signed, and vouching that the possessor has successfully passed the necessary examination. I have no doubt that, in order to start such a society, such men as Brown, Pope, Haskins, Summers, Miller and many others, would cheerfully act as examining officers for twelve months or more. What we want is some incentive for advancement. This is the only way I can now think of having a prospect of good results. I believe the telegraph companies would soon, if not immediately, recognize such an order, and demand of each applicant his certificate.

Let us drop our complaints and whinnings, and resolve to go to the top of the ladder in our profession, *When there we can see and be seen.* If we do not make ourselves prominent in our own business, it is not likely we will be solicited to embark in any other.

Now, comrades, get out your Pope's Modern Practice, and make yourselves ready for your first examination.

PERKINS.

The Proposed Society of Electricians and Engineers.

TO THE EDITOR OF THE TELEGRAPHER.

THE suggestions of your correspondent, Mr. I. N. Miller, in the last number of THE TELEGRAPHER of the formation of an American Society of Electricians and Telegraph Engineers is a very good one. There exists no adequate reason, so far as I can see, why such a society may not be organized. There can be no doubt of the existence in this country of plenty of material for such a society—all that is necessary is that the requisite preliminary steps should be taken by some of our more prominent electricians to give the movement a start. No doubt every electrician and telegraph engineer would be glad to participate in such an organization, and that it would prove beneficial and valuable will be conceded. The interchange of views and discussions which would take place at its meetings would serve to advance more rapidly than could otherwise be done correct scientific ideas and principles, and would concentrate, as we may say, the information and knowledge, much of which is now but of limited application. Errors would be eliminated—and the wisest of us, it must be confessed, are liable to error—and truth, and real science, and practical experience would be more generally available.

I know that many telegraphers are inclined to scoff at science as of little interest and value to the great body of the profession, but those who do so have little appreciation of the importance to them and to the telegraphic art, of which they are heedless or ignorant professors, of scientific knowledge and information. Without the aid of science, and the application of studious scientific individuals, the electric telegraph would to-day have been undiscovered and undeveloped. Their labors are facilitated, and their task constantly made easier, and the results more certain and reliable through scientific research and investigation. However, I will not pursue the subject further lest some of your readers may renew their complaint—that THE TELEGRAPHER has *too much* about science in it. My object is merely to express hearty approval of Mr. Miller's suggestion, and to express the hope that prompt action will soon result in the establishment of the proposed society.

ELECTRIC.

Telegraphic Improvements in Oregon.—Another Happy Man.—An Operator Resigned.

ALBANY, OREGON, April 24.

TO THE EDITOR OF THE TELEGRAPHER.
SCARCITY of telegraphic news is our reason for remaining silent so long. Allow me to assure you we have all been fluently entertained by the various correspondence in THE TELEGRAPHER; which, by the way, we are greatly pleased to see is improving with each successive issue; and let us urge our brethren to come forward with substantial aid, thus enabling friend Ashley to always *keep up his lick.*

The W. U. Telg. Co. are preparing to build an entire new line, with cedar posts, glass Insulators, and, strange to say, new iron wire. This line is to replace their old through wire which has been up for ten or twelve years, and has got to be a good deal the worse for wear. The new line will extend from Roseburg, Oregon, to Yreka, Cal., a distance of one hundred and sixty-five miles. Last fall a new line was completed south from Yreka, so, when this new section is completed it will give them an entire new line from San Francisco to Portland. This is something the boys "Long have sought and mourned because they found

it not." The last steamer brought up some three thousand glasses and over one hundred and thirty miles of wire, and Sup't Plummer will commence operations in a few days.

A few months ago there was strong talk of a new line from Portland down the Columbia river to Astoria, at the mouth of this river. This is an improvement that is absolutely required, and would remunerate the company very well. Col. Gamble, General Sup't of the W. U. Telg., made the citizens of Portland and Astoria a proposition, the exact nature of which we are not conversant with, but we do know nothing has been done in regard to this line lately. The benefit this line would be to commercial interests can hardly be over estimated.

The W. U. Telg. Co. are also, I understand, going to repair their through line from Portland to Tacoma, W. T., and from this point build a new line to Victoria. This part of the country is the hardest in the United States in which to keep a line up, on account of the vast forests through which so much of the lines must necessarily run. Heretofore, in winter, it has been next to impossible to keep continuous communication open.

Still another Oregon telegrapher has made an "unconditional surrender" to Cupid. I refer to our old chum, Gus Wheeler, at Salem, Oregon. Gus, it was thought, would never yield to the blandishments of the fair sex, but I will give him credit for holding out very well, considering that he has always been a ladies' man, and has been besieged for the last ten or fifteen years, but at last, finding it impossible to hold out, has capitulated; and we are pleased to hear has *wheeled* into a rich thing, and know he will *wheel-her* around right.

Mr. C. C. Hogue, late agent and operator at Tenino, W. T., on the Northern Pacific R. R., resigned and went East on the last steamer. Charley is going to Iowa to turn granger and till the soil; thus going into some *honest* business, as he says. Bye, bye, Charley. "Go the whole Hog(ue) or noue."

The weather is beautiful; trees and flowers have been in bloom for four weeks past. Roads splendid for driving. "Don't you wish you lived in the country?" Then you would be as happy as WEBFOOT.

The Slaughter of an American Telegrapher By Australian Savages.

VICTORIA, AUSTRALIA, }
CASTLEMAINE, Feb 25. }

TO THE EDITOR OF THE TELEGRAPHER.

WILL you kindly make known through the columns of your widely circulated paper, the enclosed account of the death of James L. Stapleton, an operator of over twenty years' experience in the United States, Canada and Australia. There are many of your readers who remember poor "Stape" (as he was generally called) quite well, and this announcement of his death will be received by them with sorrow.

As far back as 1854, or thereabouts, he served many months on the Panama and Aspinwall line, where his health suffered severely, through yellow fever.

After leaving there he became one of the Bohemian fraternity, travelling from office to office, until, at last, he crossed the line and located himself at Belleville, on the Grand Trunk Railroad, doing duty as night operator.

He was afterwards stationed at Whitby, on the same line, and, in 1858, came out to Australia. Mr. Stapleton was connected with the Victorian Telegraphs for ten years, and on the completion of the overland line between Adelaide (South Australia,) and Port Darwin, on the north coast of Australia, he left the Victorian service and took charge of one of the Maintenance offices in the centre of Australia, far away from the noise and strife of civilized life, where he expected to spend the remaining years of his life in seclusion and peace. He was a great favorite with all who knew him; and, as an operator and telegraph manager, he had the fullest confidence and esteem of his employers.

THOMAS GREEN,
Man. Elec. Tel., Castlemaine.

An Unprofitable Customer.

SAID an Irishman to the telegraph operator, "Do you ever charge anybody for the address of a message?"

"No," replied the operator.

"And do ye charge for signing his name, sir?" said the customer.

"No, sir."

"Well, then, will ye please send this? I just want me brother to know I am here," handing the following:

"To John M'Flynn—at New York—(signed) Patrick M'Flynn."

THE more machinery a nation has in operation, the more fully and profitably is its labor employed, the more rapid its material progress, and the more developed its civilization.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, MAY 9, 1874.

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Bound Copies of Volume IX for Sale.

WE have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

The Proposition for a Society of Electricians and Telegraph Engineers.

IN the last week's issue of THE TELEGRAPHER was printed a communication from Mr. I. N. MILLER, of Chillicothe, Ohio, suggesting the formation of a Society of Electricians and Telegraphic Engineers in this country. The suggestion is one worthy of consideration, and we hope that its importance will be a sufficient excuse for devoting some portion of our editorial space to it.

Mr. MILLER very truly says that we have abundant material out of which to organize such a society, and one that would be creditable to ourselves and the country. As the readers of THE TELEGRAPHER are aware, from his valuable scientific contributions to its columns, he is himself an electrician of no mean ability, and the names of others whom he mentions will be generally recognized as worthy to rank with the foreign electricians and engineers who compose the English society of a similar character. It would undoubtedly be a great advantage if the scientific and practical telegraphic engineers of the country, and of the Dominion of Canada, could be associated together, and by occasional meetings and the discussion of subjects of scientific and practical importance in telegraphy develop and concentrate the results of their individual studies, researches and experience. The English society, to which reference has been made, has proved very useful and advantageous, and mutually beneficial and instructive. The example should not be lost upon their American brethren, and we hope it may not be.

It is true that there are obstacles to the establishment and maintenance of such an association here which do not exist in England. In the first place there is not here so marked and distinct a professional

character of electrical engineering as there. While we undoubtedly have as accomplished and able electricians as any country, the profession, as a profession, has not been so generally recognized. Most of those who are known as electricians here are engaged also in the more practical telegraphic duties, and do not generally devote their time and attention exclusively to scientific studies and pursuits. A moment's consideration of the employments and pursuits of the persons mentioned by Mr. MILLER will show the truth of this statement.

Again, there are not so many of them in any one place or locality as is found in London. For this reason it is hardly probable that as frequent meetings could be held which would be attended by a considerable number of the members of such a society. This is not an insuperable obstacle, however, as there are enough in New York and its vicinity to enable one or two meetings to be held a month, and arrangements could be made for holding general meetings quarterly, at which a majority of the members could usually be convened. These quarterly assemblies could be continued in session for two or three days, and might be made very pleasant and profitable occasions for those attending them.

The advantage which would be derived to the practical operation of telegraph lines from the discussions and conclusions of such an association ought to secure to it the earnest coöperation and support of all telegraph managers and companies. A great deal of money is constantly wasted in telegraphic operations in trying experiments in batteries and insulation, and in faulty construction of lines, from the want of any authoritative and carefully considered determination of the scientific principles which underlie the telegraphic art. This, to a great extent, could be avoided by the organization and effective maintenance of such an association as has been proposed. Much that is valuable in the results of individual study, research and experience is now lost, and the same ground is constantly being gone over by different individuals which such an association would to a considerable extent obviate.

It would further add to the dignity and importance of our electricians and telegraphic engineers if there were such a method of making their ability known to the world. Membership in such an association would be *prima facie* evidence that the persons admitted had some claim to recognition, and would give them a standing at home and abroad which they could not otherwise obtain.

There is much to be said in favor of the proposed organization, but we will not further dilate upon the subject at present. We desire merely to call the attention of those more immediately interested to the subject, and hope to hear the views of others upon it. The columns of THE TELEGRAPHER are open to the discussion of this matter, and we trust that it may not all end in talk. The time seems to be propitious for action upon it, and we hope that before many weeks have passed we may be able to record the organization of the American Society of Electricians and Telegraphic Engineers.

Unprofitableness of Government Telegraphs.

OUR British friends have no doubt become convinced that, as a financial operation, Government management of the telegraphs does not pay. With all the possible manipulation of the accounts and charging to the general post-office expenses much that is properly chargeable to the telegraph service, there is a deficit stated by the *Railway News*, of London, at £1,000 per week, and which is constantly increasing. The private companies which were superseded by the Government in the business, most of them made the business profitable to the stockholders, and the public was as well accommodated as it is now, to say the least.

Government telegraphy, as a remunerative branch of the postal service, is a failure, but having assumed the ownership of the elephant, he must, of course, be retained and supported. If Government telegraphy in a

country like Great Britain, which is densely populated, and whose telegraph facilities are very generally used by the public, the circuits short and easily maintained, and the compensation of employes comparatively very small, cannot be made to pay, what is the prospect in this country? The experience of Great Britain has probably saved our own Government and people from the loss, damage and dissatisfaction inevitably attendant upon Government telegraphic administration, but it is well to keep the facts before the public and Congress. The Government telegraph schemes are merely scotched, not by any means killed, and will undoubtedly be revived from time to time by interested and ignorant parties. Until these schemes and projects are definitely abandoned we must be excused if we do occasionally refer to a subject of which we know our readers, as well as ourselves, must be heartily sick and tired.

The Telegraph Instrument Manufacturing Business.

A FEW years since there were but few establishments in which the manufacture of telegraph instruments and apparatus was carried on, but the number has increased very rapidly, and there is now in the aggregate a large amount of capital employed in it. How extensive this business has become the advertising columns of THE TELEGRAPHER shows. Of course it is necessary for each of them to avail itself of the facilities afforded for making known their existence through the columns of this paper, and almost weekly we chronicle some new applicant for patronage. As a consequence, the pressure upon our advertising columns is very great.

The competition has naturally reduced prices very materially, which is to the advantage of purchasers, if not of the manufacturers and dealers.

There is danger of the business being overdone, of course; but in this, as in every other department, the demand and supply will regulate it.

Some of the establishments devoted to this specialty are very extensive and employ many hands, while others are comparatively small. The character of the instruments manufactured is generally very good, and the work turned out satisfactory.

Nothing shows the enormous expansion of the telegraph business in this country more than this increase of facilities for supplying the increasing demand. New adaptations of electrical and telegraphic apparatus are constantly being made, which in turn develops new manufacturing business, and calls into existence new establishments for the purpose. The Fire Alarm Telegraph, the District Telegraph, the Electric Railroad Signals, the Automatic Signal Telegraph, the Quotation and Private Line Telegraphs, each use instruments specially adapted to and invented for these specialties, and many shops and hands are mainly employed in supplying them. We hope that all manufacturers will find profit in their business and be prosperous, and the columns of THE TELEGRAPHER will materially aid them in attaining this result.

New Uniform of the Atlantic and Pacific and Franklin Messengers.

THE example set by the American District Telegraph Company in uniforming its messengers has inaugurated a very useful reform in telegraphic arrangements in this city, and is gradually being followed by the several telegraph companies. We have already published a description of the uniforms adopted for the American District and Western Union Messengers.

On the first instant all the messengers of the Atlantic and Pacific and Franklin Telegraph Companies in this city were equipped with uniform suits, which are neat, serviceable, and, we think, the handsomest yet adopted. The value of such a distinguishing mark by which the messengers may be readily and easily located by those who may have occasion to receive despatches from them or send answers, etc., by them, will be readily appreciated. The business has become so large, and the number of messengers employed by the different com-

panies so great, that it had become absolutely essential that some method of identification should be adopted. Various efforts have been heretofore made to establish the system of badges or uniforms by which the messengers could be known, but until within the last two years these have not been pressed with sufficient energy to insure success. There has been considerable opposition to it manifested by many of the messengers employed. We recollect, many years ago, a small rebellion was created among the limited number of messengers then employed, by an attempt which was made to have them wear a uniform cap, and it was finally given up after a few days' use. All this is past now, however, and hereafter any person can tell a telegraph messenger when on duty at a glance, and also what company he serves, and can identify, if necessary, the individual, and ascertain in what particular office he is employed.

No doubt this system of uniforming the telegraph messengers will eventually be adopted in all large cities.

The uniform of the Atlantic and Pacific Messengers was designed by Mr. ALFRED NELSON, the Secretary and Treasurer of the Atlantic and Pacific Telegraph Company, and reflects much credit upon his taste.

It consists of a jacket and pants of cadet gray cloth, similar to that used at West Point, for the uniforms of the cadets at the United States Military Academy. These are handsomely trimmed with scarlet military cloth, which sets them off to advantage. The jacket is buttoned up to the throat with military buttons. The cap is of gray cloth with scarlet cloth band, and a leather front with the words "Atlantic and Pacific and Franklin Telegraph" on a red visor. On the left breast is worn a German silver badge, in the centre of which is the number by which the messenger is designated, and by which he can be at any time identified, and the word "Telegraph," the whole surrounded by a black border, outside of which, at the four points of the compass, are the letters "N. S. E. W." For wet weather each messenger is furnished with an India rubber cape and leggings, and an enameled cap cover, by which they are effectually protected from the rain, and their despatches and books are also secured by this means from any damage by unfavorable atmospheric conditions.

The messengers are not allowed to wear any part of the uniform when off duty except the pantaloons, being required to deposit them in places provided at the offices for that purpose for each messenger employed.

The New Atlantic Cable.

THE work of loading the cable steamer Faraday with the cable of the United States Direct Cable Co. is proceeding successfully and she will sail in a few days for the purpose of laying the cable, the eastern terminus of which is to be at Rye Beach, N. H.

The contracts for connection with the cable between the Cable Company and the Atlantic and Pacific, the Franklin, and the Southern and Atlantic Telegraph Companies has been completed and signed. This contract provides for an exclusive connection with these companies for a term of years on mutually advantageous terms. The wires of the Franklin Company will be extended from Boston to Rye Beach in time to meet the cable when the laying is completed. If nothing occurs to interfere with the carrying out of the plans of the companies a few weeks more will witness the inauguration of competition in the Atlantic telegraph business.

The Termination of the Contract between the Union Pacific R. R. Co. and the Western Union Telegraph Company.

IN THE TELEGRAPHER for April 25th we published a statement from the *New York Tribune*, that notice had been given by the Union Pacific R. R. Co. to the Western Union Telegraph Co. of the termination, under its terms, of the contract existing between them.

By the provisions of the contract six months' notice is required from either party of a desire to terminate it

and this notice was given as above stated on the 20th ult. Under this contract the Western Union Co. leased a wire from Chicago, Ill., to Omaha, Neb., to the Railroad Company, which wire has under the agreement between the Union Pacific Railroad Co. and the Atlantic and Pacific Telegraph Co. been operated by the latter, and its business for points west of Omaha transmitted over it.

The Atlantic and Pacific Co. have authorized the construction of an independent line between those points, and the arrangements for the materials for the line have, we understand, already been made. By the time the contract under which they are now working is terminated that company will have its own line in operation over this territory, and will, of course, be relieved from any restrictions in regard to business, etc., which may have existed under the present arrangement.

Telegraphy and the Rensselaer Polytechnic Institute.

WE are indebted to W. J. FABIAN, of the Rensselaer Polytechnic Institute, of Troy, N. Y., for a copy of a publication issued by the class of 1875, called *The Transit*. Whether to classify this as a catalogue, or a magazine, or what, is more than we are yet prepared to decide, as it appears to be composed of fact and fancy in about equal proportions. It abounds in sharp and witty "squibs" at the expense of the officers and faculty of the institution, which a strict regard for veracity compels us to say are not in all cases entirely undeserved. Among other matters *The Transit* contains a history of the organization and progress of the Students' Telegraph Company, which commenced in the latter part of 1872 with two operators and 20 feet of wire, and now embraces 67 operators, students of the Institute, having offices and instruments at their rooms in various parts of the city. Mr. FABIAN is General Superintendent of the company, which appears to be in a highly prosperous condition. We extend our best wishes to our enterprising young co-laborers, and we hope that their organization may live long and prosper.

Personals.

Mr. J. A. ROBLIN, formerly of the Truckee Division of the Central Pacific Railroad, has been appointed chief operator of the Sacramento Division, with headquarters at Sacramento, Cal., vice H. C. MARKS, resigned.

Mr. WALLACE COFFIN is working nights at Wadsworth, Nevada, on the C. P. R. R. lines.

Mr. J. H. VAN WINKLE has been appointed agent and operator C. P. R. R., at Hot Springs Station, Nevada, vice Mr. HARRY CHAPMAN, resigned.

Mr. D. WASHEIM is now agent and operator at Brown's Station, Nevada, C. P. R. R.

Mr. CHARLES SHEARER is ticket agent and operator at Reno, Nevada, for the C. P. R. R.

THE San Diego, Cal., *Daily Union*, of April 22d, says:

"Mr. W. E. SMITH, manager of the Western Union Telegraph Office, returned to the city last evening from a trip into the country to repair the line. He proceeded as far as San Luis Rey, fifty-one miles out, on horseback, returning by stage. He informs us that the country is looking really magnificent, grass being in luxuriant growth, while the whole face of the land is covered with wild flowers."

The Telegraph.

By Cable.

SAILING OF A CABLE STEAMER FOR SOUTH AMERICA.

LONDON, May 4.—The steamer with the section of the South American Cable to be laid from Para, Brazil, to Demerara, sailed from Gravesend yesterday.

THE NEW ATLANTIC TELEGRAPH CABLE.

LONDON, May 2.—There was a large gathering of people to-day to visit the steamer Faraday, lying off Woolwich, taking on board the new Atlantic cable.

Two thousand four hundred miles of the cable are

now ready. The steamer will sail in about ten days for the coast of New Hampshire.

The cable on this side of the ocean will be landed and submerged fifteen miles south of Valentia.

New City Offices of the Atlantic and Pacific and Franklin Telegraph Companies.

THE Atlantic and Pacific and Franklin Telegraph Cos. have opened new offices at the New York Hotel and St. Denis Hotel, of both of which Mr. F. Marsh is manager. They take the place of the Western Union Company in these hotels, the offices of which were formerly operated by the latter. New offices have also been opened at No. 118 Water street, corner of Wall street, Mr. E. E. Stewart manager; and at Thurber's new building, corner of West Broadway, Hudson and Reade streets, Mrs. Foote manager.

Removal of the Office of the Automatic Signal Telegraph Company.

THE principal office of the Automatic Signal Telegraph Company in this city has been removed from No. 82 Cedar street to No. 42 Pine street. This company is meeting with remarkable success, and its system of telegraphic protection against the spread of conflagrations is being introduced in the principal business and other buildings in this city, as rapidly as a large corps of expert linesmen, etc., can put them in.

The new office has been neatly and tastefully fitted up, and the surroundings are much pleasanter and more appropriate than at the former location.

A New Western Union Office in Baltimore.

THE Western Union Telegraph Company has removed its main office from the location which it has so long occupied on the southwest corner of South and Baltimore streets, in Baltimore. Offices have been elegantly fitted up by the company in the new building of Alexander Brown and Sons, on the southwest corner of Baltimore and Calvert streets. The whole of the spacious new building, with the exception of the first floor, which will be occupied by Brown and Sons as a banking house, has been leased to the telegraph company.

The old office which has been occupied by the American and Western Union Companies for sixteen years, was vacated at two o'clock in the morning of Saturday last, May 2.

The Superintendence of the Arizona Military Telegraph.

THE *Arizona Miner* of April 8th says, in reference to the superintendence of the Military Telegraph: "We have it from pretty good telegraphic authority that Capt. Price, U. S. A., who is now in the East, will, upon his return to Arizona, have the general superintendency of our military telegraph line, which line the Captain helped to construct and which he will, no doubt, keep in good repair. We pray for his appointment."

Foreign Telegraphic Notes.

ON the first of April telegraphic operations at Woolwich Arsenal and Dockyard, England, as well as at other government establishments, were taken under the charge of the General Post-office authorities.

The Eastern Extension, Australasia and China Telegraph Company (Limited) have announced an interruption of their Saigon-Hong-Kong cable. Messages for China and Japan must, until further notice, be sent via Russia by the Great Northern Company's lines. The tests received give the fault at a distance of 230 miles from Hong-Kong, in a depth of 118 fathoms. Instructions have been given for the repairing ship to proceed from Singapore to the locality of the fault without delay.

Advices from Panama, of April 23d, state that the Cuba Telegraph Cable is now in good working order. A message from Liverpool, dated April 17th, was received at Panama on the 19th.

The report of the Eastern Extension, Australasia and China Telegraph states: The total earnings of the company for the year ending 31st December, 1873, amounted to £223,323, the working expenses to £48,992, and the repair and maintenance of the cables to £14,116. Interest on debentures and income tax have absorbed a further sum of £3,239, leaving a balance of profit for the year of £156,974. Three interim dividends of 1½ per cent. each, aggregating £89,887, have already been distributed, and there now remain £67,087 for appropriation. The directors now declare a further dividend of 2 per cent., free of income tax, making a total of 6½ per cent. for the year, which will absorb £39,950, leaving a sum of £27,137, which will be carried to the reserve fund, thereby raising it to

£41,554. The debenture debt, which at the commencement of the year amounted to £17,100, has been reduced to £13,100 by taking up the bonds as they became due.

The traffic receipts of the Eastern Telegraph Company for the month of March last amounted to £34,899 against £33,572 for the corresponding month last year, a decrease of £1,163.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

APRIL.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
30	73 75%	.....	54½ 54½
May... 1	73% 74%	.....	.....
" 2	73% 75%	.....	.....
" 4	71% 74%	.....	50 52
" 5	69% 71	.....	.....
" 6	69% 72%	.....	47 49%

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended March 31, 1874, and bearing that date.

149,152.—ELECTRIC RAILWAY SIGNAL.—Frank L. Pope, Elizabeth, N. J. Application filed December 21, 1872.

Series of semaphoric signals operated by electro-magnets. Signal operating circuit closed by wheels and axles of train, bridging rails of insulated section. Signal kept in position after circuit is broken till released, by current sent back from next signal in series after train has passed later. Secondary signal, placed ahead of primary circuit closer, operated automatically by primary signal after latter is set,

1. The combination of the following elements: A signal disk, moved in one direction by an electro-magnet, and in the other by a weight or its equivalent; an electric circuit including said electro-magnet, and which is only closed by and during the passage of a locomotive or train; and a lug secured to the signal disk, and acted upon by a holding or retaining device or power, whereby the said disk will be kept displayed after the said circuit shall have been broken, substantially in the manner and for the purpose specified.

2. The combination of the following elements: An insulated section, *a a*, of a railroad track, forming part of an electrical circuit, including an electro-magnet which controls the movements of a visual or semaphoric signal; a visual or semaphoric signal moved in one direction by an electro-magnet and in the other by a weight or its equivalent; mechanism for retaining or locking the said signal in position against the action of the said weight or its equivalent; a second circuit closer, *b b*, operated by a passing locomotive or car, and a wire or conductor, 18—the said elements being so arranged relatively to each other that a locomotive or train passing over the insulated section *a a* will cause the signal to be displayed, and to remain displayed until the said locomotive or train has closed the second circuit at *b b*, when the said signal will be released or reversed, so as to assume its normal position, substantially as and for the purpose herein specified.

3. The combination of the following elements: A signal disk, provided with a counter-balancing device, so as to automatically either display or conceal itself; an electro-magnet for causing the said signal disk to be displayed or concealed, said magnet being included in an electrical circuit which is under the control of a locomotive or train; and suitable mechanism for retaining or locking said signal against the action of its counter-balance—such mechanism being operated by a second electrical circuit distinct from the first, substantially in the manner and for the purpose specified.

4. The combination of a primary and a secondary signal, each included in and operated by a separate or distinct branch of the same circuit, with a circuit-breaking device *F*, arranged and operated substantially in the manner and for the purpose specified.

5. The combination of the signal magnet *M* with the circuit-breaking device *F*, arranged to cut off the current from the magnet *M* before the completion of the stroke, substantially as and for the purpose herein specified.

6. The combination of the electro-magnet *N* and its armature *n* with the signal disk, substantially as and for the purpose herein specified.

7. The arrangement of the primary signal upon the line of a railroad at the distance of a train's length, or more in the rear of the circuit closing device which actuates said signal, substantially as and for the purpose herein specified.

8. The arrangement of the circuit closing device which actuates the primary signal upon the line of railroad in the rear of the secondary signal, substantially as and for the purpose herein specified.

9. The combination of the following elements: A visual or audible signal, moved in one direction by an electro-magnet and in the other by a weight or its equivalent; a device for releasing, reversing, or stopping said signal or signals, operated or controlled by an electro-magnet; a line wire, 18 or 20, including said electro-magnet; and a circuit closer, *T*, attached to and operated by the mechanism of a primary or secondary signal, substantially as and for the purpose specified.

10. The arrangement of the circuit closing device *T*, relatively to the insulated section of track *a a* and the primary signal, so that any one of a series of signals cannot be released or reversed until the train is under the protection of a succeeding signal, substantially as herein specified.

11. The combination of the following elements: A primary circuit composed of the conductors 1, 2 and 3, and the rails *a a* of a railroad track connected thereto, so arranged that the said circuit will be completed by establishing a metallic connection between two of the said rails, insulated from each other; a secondary circuit, operated or controlled by a relay, *C*, placed in said primary circuit; a visual or semaphoric signal, *G*, and an

electro-magnet, *M*, substantially as and for the purpose herein specified.

12. The combination of the following elements: A primary circuit, composed of the conductors 1, 2 and 3, and the rails *a a* of a railroad track connected thereto, so arranged that said circuit will be completed by establishing a metallic connection between two of the said rails insulated from each other; a secondary circuit, operated by a relay, *C*, placed in said primary circuit; and an audible signal, *P*, under the control of an electro-magnet, substantially as specified.

149,252.—TELEGRAPH APPARATUS FOR CABLE USE.—William E. Sawyer, Washington, D. C. Application filed February 12, 1874.

Depression of a key closes circuit to key-locking devices and to magnets *G*, bringing arm *D* into revolving wheel *H*, causing partial revolution of cylinder *B*, which closes circuits to keys *E* or *F* as a + or — current is to be sent over the cable. All currents are used for signals.

1. The combination, with the lettered keys, having an end shoulder or rabbet, as shown, of the vibrating locking armature *C*, the same being suitably connected electrically, whereby the armature holds one of the keys depressed, but prevents depression of the others till the circuit is broken, as and for the purpose specified.

2. The cylinder *B*, having strips *x* on its upper side and studs and strips *x'* on its opposite side, in combination with keys *A* having metallic connecting points, and the plates *Z*, sending instruments *E* and *F*, combined as shown and described.

3. The combination, in a receiving instrument, of the bar *Z* attached to needle *T* and having aperture *o*, with the traveling sensitized strip to direct a ray of light thereon, as and for the purpose described.

4. The mode of signaling or recording signals through a submarine line or cable, by utilizing all electrical impulses, or each movement of the galvanometer needle or needle bar, to form on the sensitized strip a positive sign, or part of a complete sign, of a word or letter, as set forth.

5. The alphabet, as shown and described.

6. The combination of the cylinder, having metallic projections on its periphery, keys having corresponding projections, plates *Z*, sending instruments *E* and *F*, the cable or wire connection, the galvanometer, the bar *T* having an eye, *A*, and the traveling sensitized strip, as shown and described, whereby dashes or curves are formed lengthwise of the strip and sidewise or oblique to the line of motion, to be read from left to right instead of from top to bottom, in reference to an imaginary zero-point, as at present, the same being connected in a continuous line, as specified.

7. The combination of the detent armature, revolving spur-wheel, magnets *G*, cylinder *B*, having metallic projections, the keys having metallic projections on the under side, and wire, as shown and described.

Married.

BERRY—PASHBURG.—At the residence of James Higgins, Austin street, San Francisco, California, April 27, by Rev. W. D. Clark, Mr. THOS. H. BERRY, of the Atlantic telegraph office of that city, to Miss BETTIE PASHBURG, of Yreka, Cal.

LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of

THE TELEGRAPHIC MANUAL,

by Mr. WALTER O. LEWIS, remaining. May be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

ELECTRICITY AND MAGNETISM.

By FLEEMING JENKIN, F. R. S.

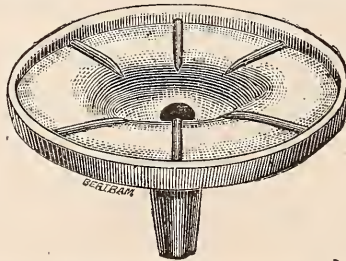
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will accord to it a patronage commensurate with its merits. For
nearly thirty years the author has been connected with the
telegraphic systems of both hemispheres and an observer for
general instruction, and this work will contain the substance of
facts thus collected, having especial reference to practical tele-
graphy.

The first four volumes will be ready for printing in May, and
the whole work may be issued in monthly parts of quarter or
half volumes.

Vol. I will contain a general history of electrical discovery
by ancient and modern philosophers—the experiments of Otto
Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek,
Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and
others who practically manipulated static electricity; the whole
prepared especially for the telegraphists as useful information
in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic bat-
tery, and the many improvements and modifications of this
telegraphic generator of electricity, considering the experiments
of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and
Grove. Also, magneto and thermo electricities, and the applica-
tion of their respective forces for telegraphic and useful pur-
poses.

Vol. III.—In this volume will be considered Terrestrial Mag-
netism, Aurora Borealis, Magnetic Needle, Ships' Compass, and
Magnetic Phenomena generally. Also, Electro-Magnetism as dis-
covered by Ersted and manipulated by Schweigger, Ampère,
Arago, Sturgeon, Henry, Faraday, Jacoby and others. The ap-
plication of these discoveries for practical telegraphy by invent-
ors, from time to time.

Vol. IV.—A general history of the ancient and modern tele-
graphic systems, semaphoric and electrical, including telegraphs
of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil,
Morse, Bain, House, Hughes and others. Also, the construction
of overland, subterranean and submarine lines, including con-
ductors, insulators, paratonnerres, and telegraphic implements
generally.

Vol. V.—This volume will give a full account of the various
telegraphic apparatuses for simple and automatic manipulation;
the combination of circuits for repeating or translating; double
and duplex transmission. It will also contain a large amount of
general information for practical telegraphists, respecting con-
ducting and non-conducting compositions, tables, and a Diction-
ary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it
will not be mathematical. The illustrations are designed for
specific instruction, and their explanation concise. It will be
so arranged that either one of the volumes may be bought by
those not wanting the whole.

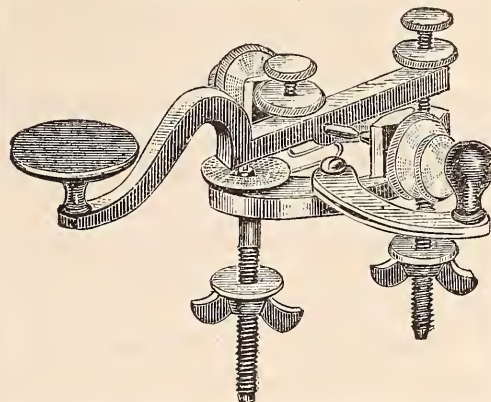
Each volume will have a complete Table of Contents and an
Index.

The above must be regarded as an approximate division of the
subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

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PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.

Will not jar open.

Slight pressure of the finger required to put lever in circuit
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Acknowledged to be a decided improvement.

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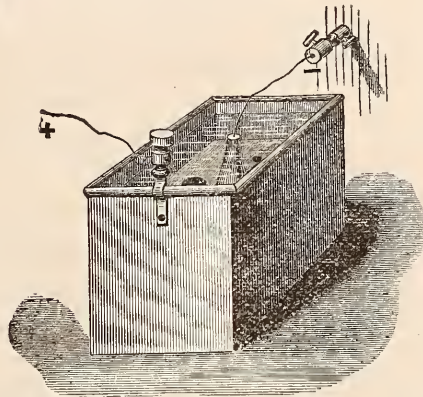
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The Battery cell is made of *lead*, and forms one pole of the
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These Batteries have been fully tested during the last year,
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WITH A CENTRAL OFFICE,

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is now in operation in the following Cities, to which references
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Lynn, Mass.,
Mobile, Ala.,
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New Orleans, La.,
New Bedford, Mass.,
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San Francisco, Cal.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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Fourth—The **Electro-Mechanical Gong Striker**, for horse and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System

OF

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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

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Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

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the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

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has met with the universal approbation and commendation of the

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AND THE

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NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

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RELIABILITY and

ECONOMY

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ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THEIR CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

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TELEGRAPH ENGINEER,

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

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a most compact and reliable switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

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SUBTERRANEAN & AERIAL WIRES,

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IRON CLAD CABLES,

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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

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Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

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He also pays special attention to the manufacture of his

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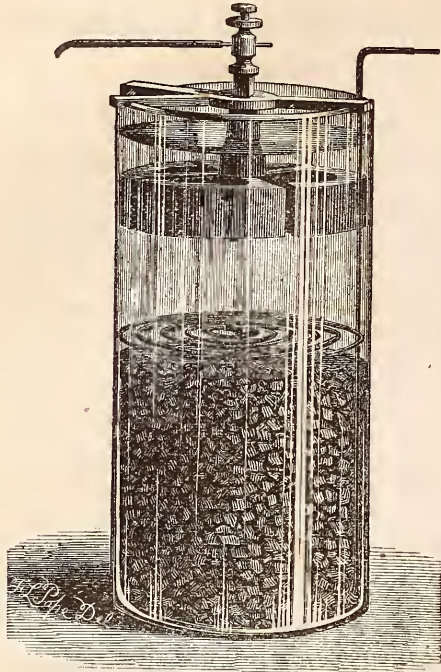
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Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-500th of an inch, the layers separated by thin paper. In Helices of silk-insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk-insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

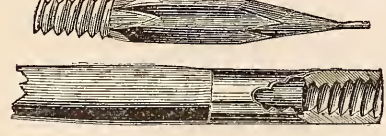
NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
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New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.
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This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.
When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.
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Price per doz., \$1.80.
Agents for towns, and counties wanted.

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Five years' operation have proved its merits.

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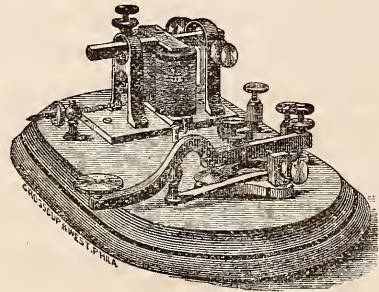
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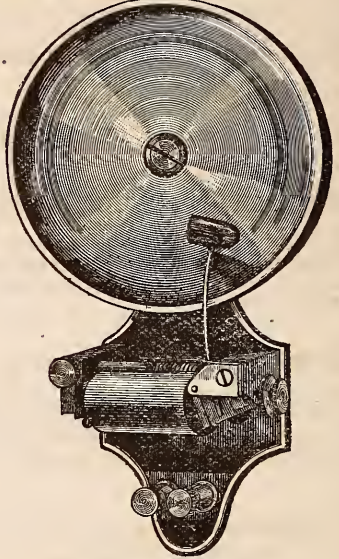
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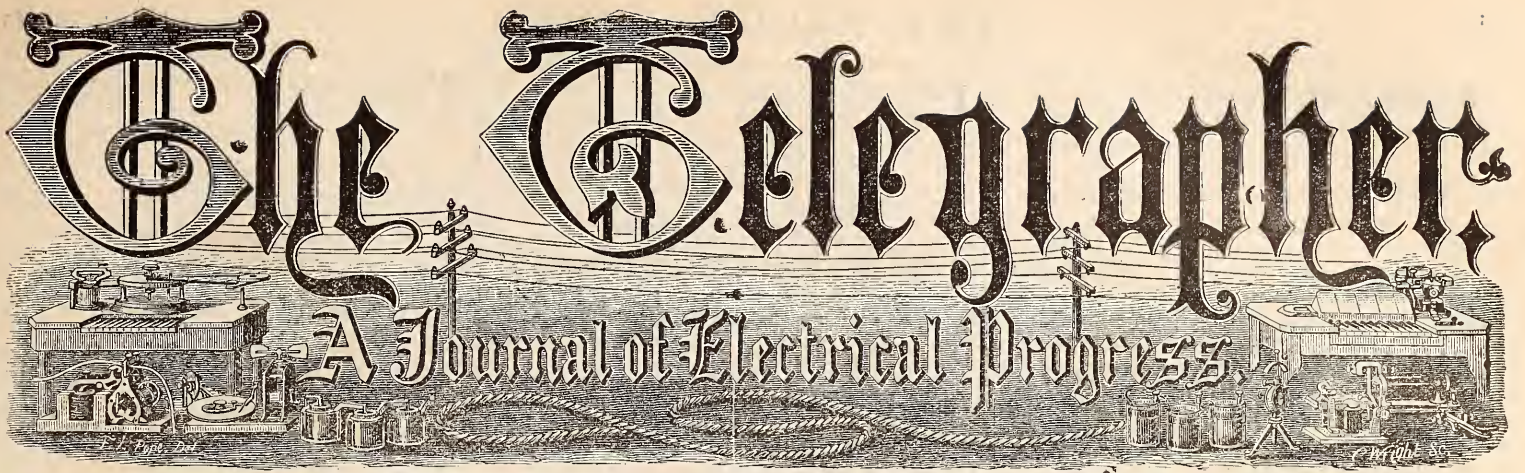
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

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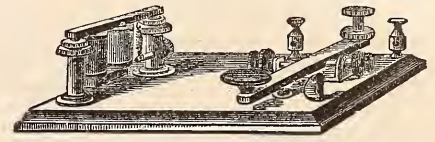
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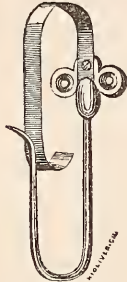
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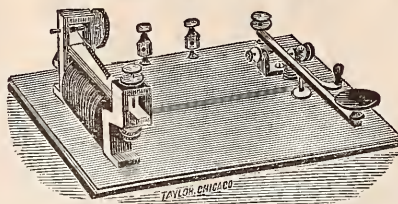
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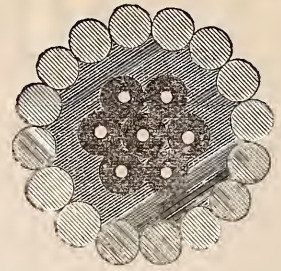
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MAY 16, 1874.

VOL. X. WHOLE No. 409.

Original Articles.

The New Baltimore (Md.) Office of the Western Union Telegraph Company.

FOR so many years have the people of Baltimore been accustomed to regard the corner of Baltimore and South streets as the telegraph centre for this locality, that the removal of the office of the Western Union Telegraph Company to the elegantly fitted up premises specially arranged for the accommodation of its extensive business in the beautiful brown stone building on the corner of Baltimore and Calvert streets, naturally gave rise to some comment.

A few months since the Western Union Company secured a lease for a term of years from Alex. Brown & Sons, of the principal portion of their banking house, then in process of reconstruction, and immediately commenced preparations for the removal of their wires and business to the new location. This was effected, as has already been stated in THE TELEGRAPHER, on the morning of Saturday, the 2d inst., and everything was speedily in order, and working successfully in the new quarters.

A brief description of the new office may not be without interest to the fraternity, and it is pleasant to note the constant improvement which is being made in the surroundings and accommodations for telegraphers and the telegraph business. The policy of the Western Union Company of late years has been very marked in this particular, and the dingy and restricted quarters which were formerly considered good enough for telegraph offices are being abandoned, and spacious, well lighted, arranged and ventilated rooms provided, to the decided advantage not only of the public and the employes, but of the Company as well.

The new receiving and delivery department are on the first floor of the building, and are reached by a descent of two steps from the sidewalk. Rich black walnut counters, with polished veneered panels, supporting neatly designed frame work, in which are ground glass plates embellished with the monogram of the Company, afford the necessary accommodation for transacting business with the public. At proper intervals along the counter neat silvered standards are seen, each supporting an Argand gas burner, which serves to brilliantly illuminate the room by night, and are a handsome ornament as well by day. This room is connected with the operating department by a pneumatic tube, which is worthy of especial mention. Being both an exhaust and discharge apparatus, it cannot, by ordinary use, be liable to the objection of becoming blocked up, which, in others, is so frequently complained of. An additional noticeable feature is a branch connecting directly with the desk of the receiving clerk, which is at some distance from the main tube, by which he can start messages directly to the operating room, obviating the necessity of calling a messenger to carry them to the box for that purpose. This saves time, as well as avoids any unnecessary handling of the despatches. An ingenious arrangement will be attached to the upper end of the tube, by which an ascending box will break an electrical circuit, and, by ringing a bell below, notify the person in charge of the blast when the messages have reached the top. A mirror placed at the proper angle in the lower part of the apparatus shows when the tube used for sending messages down is clear. Should either tube become blocked both can be connected, and may be easily cleared by creating a vacuum with the exhaust. In short, every precaution has been taken to insure absolute promptness and reliability in the transmission of messages between the lower and upper parts of the building.

On this floor are found the Receiving and Delivery Clerks, Messrs. Isaac Hess, Malcolm Hart and John T. Cross; and the Cashier, Mr. John G. Riley, who served the Bankers' and Brokers' Company for a long time very acceptably as the manager of its Baltimore office, and was well known as a first class operator when the writer of this had not fully satisfied himself that there was no actual necessity for registers.

The operating room, which occupies the entire third floor, is one of the most desirable and pleasant that could be provided for the purpose. Three large windows in front and four on the side, furnish ample facilities for light and ventilation, while two smaller

windows in the rear are available for the same purposes when required.

The operating tables are of the well known Western Union pattern, adopted generally for large offices. There are twenty of these in the room, each arranged for four sets of instruments, which are separated from each other by partitions of heavy hammered glass, with a neat Argand gas burner in the centre, so placed as to afford ample light to all the instruments on the table at night.

The switch board which has been manufactured expressly for this office, is similar to that in the office of the company at 145 Broadway, New York, and which was fully described in THE TELEGRAPHER of January 20, 1872, and will accommodate forty-eight through wires. From the switch board the wires are carried by cables under the floor to the tables. In addition to the regular Morse apparatus there are two sets of duplex instruments, one for the New York circuit and one to provide for cases of emergency; besides two sets of duplex repeaters for the circuits between Washington and Cincinnati, and Philadelphia and Washington. There are also three sets of Milliken repeaters, which are doing the same service at this point, passing dots and dashes, that has made their excellent reputation wherever they have been used.

A Siemens Universal Galvanometer, lately added to the equipment of the office, affords opportunity to the operators of a scientific turn to investigate the phenomena of insulation and resistance.

The fourth floor is devoted to the main and local batteries. One thousand cells of Callaud battery, arranged very conveniently, are kept in excellent order by the intelligent batteryman.

Ascending to the roof, we find a perfect mass of wires coming from every direction and centring to the cupola, from whence they are conducted to the switch board, after passing through the lightning arresters, which are placed in convenient position for examination in case of trouble. This part of the machinery is the only one that calls for criticism, but there are many better and more reliable arrangements for this purpose than the old one of a pair of brass plates with paraffined paper between.

The manager of the Western Union Company in this city, Mr. Archibald Wilson, Jr., has his desk in the operating room, and while looking closely to the interests of the company, has won the respect and esteem of all the employes of the office.

Mr. C. C. Wolff, chief operator, and Mr. Jack Guthridge, assistant, attend to the wires during the day, and our old friend, Mr. Frank Morrison, gives satisfaction to all having business with the office at night, as night manager. The operating force consisting of twenty-two operators, thirteen of whom comprise the day force, and nine the night force, are all well known members of the fraternity, and will compare favorably with the employes of any other office of the company. Some of them have been engaged in the business since the days when it was not unusual to close the office while they went over their divisions to repair a break, or lift the wire from a mud hole. Some remember the late "unpleasantness," and relate their experience in the Confederacy with more relish than the opportunities for obtaining them warrant.

The regular force of the Western Union Company in Baltimore may be summed up as follows:

- 1 Manager,
- 22 Operators,
- 10 Clerks,
- 7 Office boys,
- 1 Janitor,
- 1 Batteryman,
- 2 Liuenen,
- 17 Branch office operators and clerks,
- 42 Messengers

Total, 103 employes.

From this an idea may be obtained of the importance of the office, and of the extent of the telegraph business transacted. The work of arranging the wires through the city in preparation for the removal to the new office, was done under the supervision of Mr. Hubert McAleer, whose duties were most satisfactorily performed. The cupola is reached by 108 wires, many of them loops and city lines, and the connections were so made that at short notice one office could be closed and the work resumed and continued in the other, and it certainly was highly creditable to all concerned that not a single error in the connections was discovered when the change from one office to the other was made.

The first line of electric telegraph in this country was inaugurated between Baltimore and Washington, and has become historical as the starting point of the system which, during a single generation, has developed into such a universal and mighty agency. There are many citizens of Baltimore who refer often to the early days of the telegraph system, when doubts were so generally entertained and freely expressed of the practical success which was even then demonstrated, and with gratification at its rapid progress and development which they have lived to witness, and which has

a fitting and appropriate illustration in the change which has been required in the accommodations for the business of the Western Union Telegraph Company.

Baltimore, May 9.

N.E.

Telegraphic Ability, Natural and Acquired.

BY OLD TELEGRAPHER.

IT has been said that some men are born great, some achieve greatness and others have greatness thrust upon them. So it may be claimed that some are born to telegraphic pursuits, and to them acquiring the telegraphic art comes naturally and easily; while others achieve telegraphic proficiency through a severe course of study and practice. Perhaps there can be cited no instance where eminence in telegraphic acquirement has been thrust upon any individual, but, considering the utter incompetency exhibited by some who fill important and sometimes prominent telegraphic positions, it would seem as though, in their cases at least, telegraphic greatness must have been forced upon them, or it would never have been witnessed.

The natural telegrapher, or one to whom telegraphic proficiency comes easily and without any special effort, is apt to be superficial and mechanical, and, from the lack of close application and industry, seldom becomes more than a mere transmitter and reader of signals. He does not see the use of so much study to master the scientific principles which underlie the telegraphic art, and, when off duty, cares for little but recreation and physical gratification. It is useless to expect anything further from this class. It should not be understood, however, that all who acquire telegraphic proficiency easily are of this character. There are honorable exceptions and those who combine natural aptness with industry, and a desire for the acquisition of useful professional and scientific knowledge, make very valuable and progressive telegraphers, and are seldom in want of employment, and at the highest rates of compensation.

But it is mainly those who are compelled to acquire telegraphic proficiency by application and persistent study and practice who in the end make the most efficient and reliable telegraphers, and are in demand for the more important telegraphic positions. In the earlier stages of their telegraphic education such persons are apt to be greatly lacking in confidence; and when they do get an opportunity to engage in actual telegraphic work are likely to exhibit extreme nervousness, which makes their performance partake more of the plug character than it would were they more confident of their own ability. This, however, soon wears off, and until it does they must harden their sensibilities against the sharp and scornful deprecatory remarks in which operators are wont to indulge in working over the line with beginners or with those whom they regard as less efficient than themselves. They can console themselves with the anticipation that the time will surely come when they will be able to outrank their critics as telegraphic artists, and should learn from their own experience to be more considerate when, in their turn they have become experts, they may be called upon to work with others similarly situated as they are at the time.

The proposition of Perkins in the last number of THE TELEGRAPHER, for establishing a telegraphic organization which shall establish different grades of telegraphers who shall receive from competent authority certificates according to their proficiency, is an excellent one, and would undoubtedly inure to the advantage of the class which we are considering. As the race is not always to the swift or the battle to the strong, so the highest grade would not always be accorded to the operator that could most easily and speedily acquire a mere machine facility of manipulation. While rapidity of manipulation is desirable, accuracy and reliability are more important and more valuable in the end. Accuracy is not unfrequently sacrificed to speed, and to a foolish pride which prevents some operators from "breaking" when receiving, and thus guessing at the words which have been lost or indistinctly transmitted.

It cannot too often be urged upon aspirants for telegraphic honors and emoluments, that the only way in which these can be worthily acquired is by aiming at a thorough knowledge of the scientific principles upon which the telegraphic art is bound; as well as by expertness in the merely mechanical telegraphic duties. The more thorough the knowledge of the telegrapher the more valuable are his services, and this fact will eventually be recognized. It is one great defect of the European telegraphic systems that they aim at nothing and expect nothing of the class known in this country as operators, except mere ability to transmit and receive telegraphic signals. Usually this class know nothing of electrical science, or of any other than the special duty for which they are employed—that of sending and receiving telegraphic signals. There is not the inducement for them to endeavor to rise above this, even, if they had the inclination, for there is little hope that they can ever reach the higher and better paid telegraphic positions. In this country the messenger boy of

to-day, may without any unreasonable presumptions look forward, with proper effort and application, to becoming an operator, manager and superintendent in the course of a few years. When they are liable to be called upon for such important positions and duties, it becomes necessary that adequate preparations should be made. Those who devote their time and attention to acquiring scientific and professional knowledge and information, may reasonably expect to achieve position and compensation in the end. The path may be difficult and laborious, but the object to be attained is worthy of the labor and sacrifice, or if not so considered then it should not be made.

It is not proposed to consider those who have telegraphic greatness thrust upon them. In fact they are worth very little consideration, and any time spent in discussing them would be wasted. As they are indebted to personal favoritism for their advancement, so we may rely upon their downfall when the sustaining power of such favoritism or other adventitious support is withdrawn.

Telegraph Department of the Reading Railroad Company.

THE general offices of the telegraph department of the Philadelphia and Reading Railroad Company in this city have been transferred to the two ground floor rooms on the northeast corner of the new building, along the main hall. The large room fronting along the Philadelphia and Reading Railroad is used as the operating room for the transmission and receiving of messages and has been handsomely fitted up, and presents a neat and tasteful appearance, the counters, tables, etc., being of heavy walnut and ash wood and well finished. In the operating room there are 13 sets of instruments, by which telegraphic communication is had with all points along the Philadelphia and Reading Railroad, and all its branches. One of the principal features of this room is the switchboard, which is adapted for 25 lines. It is 4½ feet long, and 3½ feet wide, and contains about 5,600 pieces of metal and wood, and is so arranged that by simply changing the position of the metallic plug, any two lines can be connected together or changed; also any set of instruments in the office can be connected to any line. The iron wires upon the outside of the building are connected to the switchboard and thence to the telegraphic instruments by means of cable wires, which are encased with neat walnut frames, thereby not exposing any of the wires to view. The batteries are kept in the basement underneath the telegraph office. Another important feature of the office is the manner of giving the correct standard time of the Philadelphia and Reading Railroad Co., to all its telegraph stations, 255 in number, along the main road and all its branches. At three minutes to 4 o'clock P. M. daily, except Sunday, all business on the lines is suspended, and by means of a series of repeaters, all the lines of this Company 36 in number, are arranged so as to be operated and controlled by one operator at the Reading office, who has a chronometer before him, from which the correct time is given. Commencing at three minutes to 4 P. M., the Reading operator says "Time" on all the lines, which calls the attention of all operators to adjust their clocks, and continued at short intervals, until five seconds to 4, when he opens the circuit. At 4 o'clock he makes one tap: at fifteen seconds after 4, two taps; at thirty seconds after 4, three taps; at forty-five seconds after 4, four taps, and at one minute after 4, five taps. By this arrangement every telegraph station is able to get the correct time to the second, daily, and thereby have the railroad clocks and watches of the employes properly adjusted, which is a very important matter in the management of a railroad. The adjoining room west of the operating room is also handsomely fitted up and furnished, and is occupied by Mr. C. T. Sellers, Superintendent, and Mr. H. W. Spang, Assistant Superintendent of the Telegraph Department, who have charge of all telegraph lines, offices and telegraph employes of the Philadelphia and Reading Railroad Company. The Telegraph Department of this company is becoming very extensive. The lines extend from Philadelphia to Chester, Germantown, Chestnut Hill, Norristown, Reading, Pottsville, Lancaster, Columbia, Wrightsville, Harrisburg, Dauphin, Pine Grove, Towey City, Shamokin, Treverton, Ashland, Shenandoah, Tamaqua, Catawissa, Danville, Williamsport and all intermediate points. There are at present 36 distinct lines, embracing 1,680 miles of wire, 255 offices, 410 sets of instruments, and 470 operators, messengers and other telegraph employes. Extensions of lines are constantly being made, and new offices opened. In addition to the telegraph office at the new depot, this Company have offices at 449 Penn Square and 610 Penn street, and thirteen other offices throughout the city for the convenience of the public and the Railroad Company. The rates of this Company for the transmission of messages for the public have always been moderate, and messages are transmitted and delivered with promptness as they have extensive facilities for doing the business, having offices

in all parts of the city of Philadelphia, and connecting with lines of the Franklin and Atlantic and Pacific Telegraph Companies to all parts of the United States.—*Reading (Pa.) Times and Dispatch.*

Telegraphing Above the Clouds.

A FEW days ago Sergeant E. W. Boutelle, of the United States Signal Service, passed through this city en route to Washington, where he is to receive promotion. This gentleman had been stationed at Colorado Springs, in connection with the Pike's Peak Observatory, since last July, when that station was formed. During that time he has had many interesting experiences, both upon the summit of the mountain and in the construction of the line from Colorado Springs up the side of the Peak. During his brief sojourn here he detailed to a *News* reporter some points which may be of interest to the public.

The telegraph line, which reaches from Colorado Springs to the summit of Pike's Peak, is twenty miles in length. It passes along a trail made during the past year, which is far more easy of ascent than any of the old routes. It is now possible to ride an animal from the base of the mountain to the Signal Station on the top of the Peak. Mr. Boutelle has been engaged most of the time keeping the line in repair, and in the discharge of his duties has made fifty-two ascents of the mountain. He has passed one hundred and forty-two times over the Government trail—more frequently than any other man—and is familiar with every foot of the route. The telegraph wires are stretched on poles and along the dead pine trees. The line gets out of repair frequently, by reason of the trees falling and breaking the wire. The extreme cold at the summit has also at times so contracted the wire as to break it.

Life on the summit of Pike's Peak during the winter season is rather precarious. With the thermometer over thirty degrees below zero at times, the wind blowing so strongly that exposure to it is dangerous, the snow driving in blinding clouds, the experience of the observers stationed at that great height was a varied one, and still fraught with a tedious monotony. The signal station is a substantial stone edifice, and is occupied by three officers, who manage the affairs of the observatory at that end of the line.

During the winter Mr. Boutelle, in going up the trail, wandered from the route, and was lost for four days. He managed to make his way to the lake, a few miles from the summit, and there remained in an old log house, with no food, and only a sheet iron stove, that happened to be there, in which to make a fire. With his hatchet he endeavored to cut a trail through the snow for his mule, but it was impossible, the strong wind filling up the opening, and the extreme cold nearly freezing him to death. At the end of four days the weather moderated, and he got through to Jones' ranche, eight miles from the summit, where he was cared for. The snow in places up the trail is from five to thirty feet deep—many ravines being drifted full.

All the provisions are packed to the summit from Colorado Springs, the wood being obtained from the edge of the timber line below the observatory. Wood has cost the Government as high as \$22 per cord, laid down at the house. In the months of December and January it cost 1½ cents per pound to pack provisions from the Springs.

The officers stationed at the summit are R. C. Seyboth (in charge), L. A. Lemman and D. E. O'Leary. At Colorado Springs are Henry Fenton (in charge), and H. W. Tibbetts.—*Denver News.*

Submarine Telegraph Property.

LAST week we called attention to the depression of submarine telegraph stocks, and showed that, as regards the Anglo-American, its intrinsic worth was far in excess of its market value. Since then we have received the announcement of a temporary interruption; but that circumstance, although it has caused a considerable fall in the price of stock—or, perhaps we might with greater accuracy say, has given the "bears" a covert under which they may go in and depreciate it—has in no way modified the opinion which we then expressed. On the contrary, it adds considerable emphasis to it; inasmuch as the transmission of messages remains uninterrupted. There could be no more undeniable proof of the advantage of having a plurality of cables. That is the effect which the "breakage" in question must have upon the mind of every man who rightly considers the circumstance. In itself it is a mere bagatelle. It occurs fifteen miles from shore, in shallow water, so that the repairing of it is a mere matter of time—not of days, but hours—and we dare say that the repairing ship is by this time over the spot, and using the grapnels to bring up the cable that the fault may be made good, and we repeat that the moral of the accident tells well in favor of the plurality of cables. This is further illustrated by the fact that, notwithstanding the interruption of the Eastern exten-

sion cables, the traffic of that company continues to be worked with the utmost regularity to all parts of the East, Japan included—a matter which is of paramount importance now that the famine in India excites such deep sympathy in this country. Why is this? Simply because their working agreement with the Great Northern Company practically gives them possession of a second cable. Looking to these facts, we confess we should like to see those who are entrusted with the management of submarine cables directing their attention to the multiplication of such agreements, if not to complete amalgamation and fusion of interests, so as not only to protect the public, who are their customers, against the probability of delay, but also the proprietors who have entrusted to them the guardianship of their interests. That being our view, we confess to feeling some pleasure when the rumor reached us, which we have reason to believe is correct, that the negotiations pending between the Indo-European and the Eastern are likely to terminate in an agreement of the kind we have mentioned. The statement, too, made by the chairman of the Eastern Extension, cannot be regarded other than satisfactory, that the Australian Governments are negotiating for a lower tariff over the lines, offering to reciprocate the favor by granting the company a subsidy. We all know how Sam Slick sold his clocks. Soft sawder and human nature have the same power over Governments as over individuals. The farmer's wife having enjoyed the use of the clock for a few days did not want to part with it, and just when Governments and peoples have once tasted the enjoyment of rapid communication they can never after do without it. The example of the Australian colonies is one which we hope to see followed by the Indian Government, which owes a deep debt of gratitude to the company which has conferred the boon of telegraphic communication upon the Indian empire, and thereby enabled the authorities there to hold immediate intercourse with those at home. We have seen the advantage of this in the means taken for the alleviation of the famine, and it is impossible to overrate its importance in the event of mutiny or outbreak among the native troops. In the West, we are happy to observe a fusion of interests in the arrangements between the West India and Panama and the Central American Companies. All extensions foreshadowed under that agreement must tend to increase the traffic on the trunk lines, as they are not hampered by parliamentary edicts and working agreements. We repeat, then, that, with these prospects before them, the proprietors of submarine stock need not be at all apprehensive as to the future of their property.—*The Railway News.*

[From the *Alla California.*]

The Pacific Cable.

THE advantages which will result from the laying of a telegraphic cable connecting the United States with the Central Pacific Islands, Japan and China, are potent to the comprehension of all. We have already established steamship lines between San Francisco, Japan and China, and in all probability other steamship companies will soon follow, as the trade between our coasts and the commercial cities of the far East is continually increasing in magnitude and profit. To this trade a strong impetus was given by the building of the Pacific Railroad; and when other railroads are completed, our commerce with Eastern lands is destined to be greatly enlarged. The fleet of merchant vessels upon the Pacific will probably be doubled, and the relations between our country and the countries of the Orient will probably be as close as those existing between the United States and the nations of Europe. That direct telegraphic communication should be established with countries already united to our own by bonds of commercial interest, is of great importance.

Some years ago a telegraph between this coast and that of Asia was considered a necessity, and great progress was made in the surveys, and the line was constructed well into British Columbia. Expeditions were sent forward to Alaska, and across the ocean to Asia, where a portion of the expeditionists spent a year or two in Siberia, making observations and surveys; but, the completion and working of the first or second Atlantic cable, and, perhaps, some other causes, led to the abandonment of the project for a while. And thus, although many portions of the Continent have been girded by the wire, and the seas, bays, and oceans, have the lightning messenger passing through their waters, uniting many nations as one, we in America have no connection of the kind with the east coast of Asia, and the great island continent of Australia, and the islands lying between, except by the lines through the nations or waters of Asia, the Red and Mediterranean Seas, Europe across Ireland and Newfoundland, and under the Atlantic. To hear from Australia, with which we have a large and growing trade and intercourse, the words must travel perhaps thirty thousand miles to reach us six thousand miles away. A line to China would save us three fourths of the distance, cost and time now expended.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The New Western Union Office.—Other Telegraphic Matters of Interest.

BALTIMORE, MD., May 11.

TO THE EDITOR OF THE TELEGRAPHER.

The principal topic of interest here is, of course, the new office of the Western Union Telegraph Company, which has now been occupied for a week. The change from the somewhat dingy and restricted quarters previously occupied is as great as it is gratifying. The associations connected with the old building on the corner of Baltimore and South streets, which for sixteen years has been occupied as a telegraphic headquarters, of course endeared it to many, but it had outlived its usefulness and appropriateness in this respect, and it will soon be numbered with the things that were. It would be a good idea for some competent person to write up its history for the columns of THE TELEGRAPHER, with a record of the companies which have occupied it, and the different managers and other employes who have served within its walls. Such a history could not but prove interesting and instructive, and it is to be hoped that it may be written.

The new office on the corner of Baltimore and Calvert streets is beautifully fitted up for the business, but as it is understood a description of it is to appear in THE TELEGRAPHER of the present week, it is not necessary to refer to it more in detail in this communication.

The enterprise of some capitalists continue to afford opportunity for the development of telegraphic facilities and advantages, and their introduction here, so that we are not in this respect far behind even the metropolitan city of New York. The Gold and Stock Telegraph Co. have had their system of telegraphic reports of financial and business quotations in operation here for some time, and have a good share of patronage. Within the last few days the neat uniforms and intelligent countenances of a number of the messengers of the American District Telegraph Co. have made their appearance upon our streets, which shows that the world moves, and that Baltimore will not be satisfied with anything less than the facilities and advantages elsewhere enjoyed.

The Franklin Telegraph Company, which is now located a few doors from the former Western Union office, have been and are doing a very good business, and, under the management of Mr. Walter Stuart, will continue to deserve well of the public.

The operators here are rather disposed to join hands in the League proposed by Perkins in the last number of THE TELEGRAPHER. They think a combination to advance themselves in knowledge of paramount importance, and are preparing for a branch of the society proposed by I. N. M. in a late issue of your paper.

BALTIMOREAN.

Resignation of Mr. James S. Urquhart, and a Valuable and Appropriate Presentation.

SAN FRANCISCO, CAL., April 25.

TO THE EDITOR OF THE TELEGRAPHER.

ANOTHER old landmark has gone—not where the woodbine twined, but gone out of the fraternity. This time it is Mr. James S. Urquhart, whose resignation as manager of the Western Union Telegraph Co. took effect on the first of April. His associates could not allow him to leave without presenting him with some *souvenir*, which they accordingly did, in the shape of a case full of the most valuable works of poetry, history and science, valued at \$500. Those of the operators who could absent themselves on Thursday, April 25th, repaired to Mr. Urquhart's residence and made the presentation, Mr. Delos J. Howe reading the following address:

“Mr. Urquhart: When you determined to sever your connection with the Western Union Telegraph Company, your friends and associates there decided to present you some sort of testimonial as evidence of the high esteem in which you were held by them. They might have selected a *cane*, but probably thought you were not able to bear it; or perhaps a *watch*, but a man who has so often aided in annihilating *space* and *time* don't want any more watches. A *ring* might have been given, but we reflected upon the quiet simplicity of your tastes and manners—and then there are too many *rings* in the world any way. There is a sort of dreary monotony about most of the friendly and complimentary presentations of our times. It nearly always means a walking stick, a watch and chain, a ring, or shield or badge, loaded down with names and legends, or a meerschaum pipe, which might half kill the recipient to color satisfactorily. Your old associates have invaded this monotony, and, in the spirit of pure friendship and a close regard for your physical, moral

and spiritual welfare, have upon this occasion made you the donee (that is an ancient *law* term, meaning the fellow who gets it) of a choice selection of literary works. A good book is at once a companion and a friend. It is our wish that you may always have a friend, and you *have* hosts of them all around you. Still, you can always feel that there are *these* at home on the shelf waiting for you. Your leisure hours will not be idle hours; and, as you drift quietly through these pages, memory will revive the names of all those who by this means testify their friendship for you and yours.

“Another monotonous thing about presentations is long speeches by the parties presenting or by that person whom they may have selected to perform. That I should not make this address too long I reduced it to writing. In conclusion, therefore, Mr. Urquhart, permit me, without even a suggestion of flattery, to speak for these your friends, and for myself, too, in testimony of your good qualities as a man, your faithfulness as a friend, to your uniform courtesy in all social and business relations and associations. We have observed them all, so has the press, and hosts who have learned to call you *friend*, but who are not present, either here or in the city, even, will *swear* that what we may and *do* say on that point is true. They will ever wish you health, happiness and prosperity, in the full confidence that when you get ‘thirty,’ as we all shall in time, you will report all ‘O K’ on the other side.”

Mr. Urquhart, in a few well selected sentences, thanked the operators for their kindness, and assured them that, although he had *cut out*, he could never forget that the connections were all good, and ready to turn on the battery at any time. That battery was also supplied to him—every cup being represented by a valuable book; and every time he took one in his hand he was *connected* again with the fraternity. He then invited the boys into the dining room, where Mrs. Urquhart had prepared a sumptuous repast at short notice.

Present—Miss Irving (Mr. Urquhart's sister-in-law), Messrs. Frank Jaynes, H. C. Ladd, John R. Yontz, J. Waldo Thompson (of Yreka), Nelson H. Brown, Delos J. Howe, George Sawyer, Len. W. Storrer, T. S. Cunningham, J. W. Collins and the host and hostess.

The viands and wine being discussed, the parlor was again revisited, where songs and music were kept up till midnight, when the party bade their old manager and his amiable wife a hearty *God bless you!* and left for their respective homes.

ROVER.

The Proposed Telegraphic Association.

PHILADELPHIA, PA., May 12.

TO THE EDITOR OF THE TELEGRAPHER.

The communications in regard to a Telegraphic League or Association which have appeared from time to time in THE TELEGRAPHER have been read with much interest. It has struck me, however, as probably it has many others that, as a general thing, they lack the element of practicability, and that the writers had very indefinite ideas of the means of accomplishing the desired objects. Usually, they disclaim any intention of resorting to strikes or forcible measures of any kind for this purpose, but have an impression that in some mysterious and undefined manner the mere organization of an association was to remedy the evils under which the telegraphic fraternity is laboring. They cry “League,” “Association,” “Union,” but to what end?

Certain facts must not be ignored in considering and discussing this matter if we would attain any substantial result. In the first place we must take into account the fact that telegraph managers will, in this matter, act together, and for what they consider to be the interest of their respective companies. Any attempt to establish an improvement in the circumstances of the employes, unless the whole, or nearly the whole of the employes are engaged in, and will adhere to it, will be successfully resisted, and our experience in the past has not been such as to encourage us to expect that this can be relied upon. Any effort to enforce our requirements, otherwise than by moral and persuasive influence must fail. These are truths, and they may as well be accepted as such.

Must we, then, abandon the idea of securing any improvement in our condition? I think that this question has been very satisfactorily answered in the negative in the suggestion made by Perkins in his communication which appeared in the last week's issue of THE TELEGRAPHER. His suggestions in regard to establishing different grades of telegraphers, each of which shall be properly authenticated after a suitable examination by a competent board of examiners, is a very good one, and could, no doubt, be made eventually satisfactory to, and secure the cooperation of most of our telegraph managers. It is manifestly for the interest of all companies to secure, if possible, the class of employes best qualified to discharge satisfactorily and properly the duties of the positions to which they may be assigned.

Let us, then, all take up Perkins' suggestions and prepare to act upon them. It is the only practicable suggestion that I have seen as yet, and the only one which, in my judgment, promises favorable results.

Perkins's Plan for a Union Approved.—Practical Suggestions.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE carefully read the numerous communications from the correspondents of THE TELEGRAPHER for the last three or four months, in relation to Telegraphers' Unions, etc., but none have pleased me so much as the one in your last issue (May 9th), signed Perkins.

It seems to me that such a certificate plan as he suggests would promote much good, and give the really worthy and competent operators a better chance to procure situations, and “bar” the inferior ones out until they became qualified, and had passed a strict and classified examination.

Such examinations can be drawn up to coincide with the number or class of certificate issued, and each operator obtaining one should be required to sign the certificate in their own handwriting. This would, to a great extent, prevent *petty fraud* in exchanging certificates, or, perchance, a *certificate loan*.

A description of the holder of the certificate would not, I think, be out of order, and would be a protection that every *good operator* would willingly be under.

Another point, and I will drop my pen. It strikes me that gradually this system would, by a careful adherence and attention, lead to the classification of salaries, and blot out the evil of paying an indifferent or bad operator as much as a *good* one.

This would, I think, benefit us more, morally, socially and even financially, than all the leagues and unions we could organize. Perkins, let's hear from you again; and boys, all of you, think of this; compare the two and give your opinion. Join hands and circle around. Give me yours, Perkins.

ELI.

Seasonable Mention and a Sensible Suggestion.

TO THE EDITOR OF THE TELEGRAPHER.

THE advent of spring, which in this northern section has been so long delayed, will bring up the usual subjects for discussion in THE TELEGRAPHER, and we may expect to see its columns occupied with communications in regard to vacations and other matters of seasonable interest. For the time, telegraphic leagues and associations will be given the go-by, and we shall babble of the heat and dust of the cities, the discomforts of confinement in close offices, etc., and the beauties of green fields and running brooks (not of Arkansas, however), and the necessity for rest and recreation for those who have toiled through the year, faithfully and laboriously, or otherwise, in the discharge of telegraphic duties.

The policy of telegraph companies in the matter of granting vacations to their employes seems to be pretty well established. It is that such shall be afforded upon condition that a substitute is furnished by the employe or salary deducted for the time he or she is absent from duty. The day when it was customary to allow each season a week or two of relief from duty, without expense to the employe is past. We may consider this a mistaken policy, but that will not help our case, and to what is inevitable we must submit with as good a grace as we can command.

It is to be hoped that the telegraphers will not in making their calculations and arrangements for the coming season, ignore the claims of THE TELEGRAPHER to their consideration, and attempt to economize by dispensing with its weekly visits. The influx of subscriptions should continue through every season. It never takes a vacation, but comes to us regularly, its columns well filled with interesting and instructive matter the whole year round, and we should see to it that its publisher is encouraged by the evidence of our appreciation in a constantly increasing subscription list. Let us all make it a personal duty to canvass among our friends and acquaintances, whether at home or abroad, for additional subscribers, that its influence for good may extend in a constantly widening and deepening circle.

A TELEGRAPHIC SUBSCRIBER AND CANVASSER.

Personals.

Mr. MACALLISTER, night report operator of the Western Union office at Rondout, N. Y., has resigned to engage in the hotel business at Glen Cliff, N. Y.

Miss ELLA M. FRENCH has been appointed Manager of the American Telegraph Company's office at Saginaw, Mich.

Mr. STEPHEN G. SAUNDERS, of the night force at 145 Broadway, N. Y., has resigned, and goes abroad in a mercantile capacity.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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The Improvement in the Offices Provided for Telegraph Business.

It is not many years since almost any sort of a room or building, provided it was in a central location, was considered good enough for telegraphic purposes. Even at the present time many even of the more important telegraph offices are very unfit for occupancy for the purpose, but there is a decided improvement in this respect, which it gives us much pleasure to note and record. Formerly very little attention was paid in selecting and fitting up rooms and buildings for telegraph occupancy to their adaptation to the purpose for which they were to be used, and less to the matter of adequate light and ventilation. Most of us have recollections of dark and stifling rooms, crowded beyond all reason with occupants, frequently underground, some of which were almost totally unfitted for any kind of permanent occupancy, in which telegraph employes were cooped up day and night, the consequence of which was visible in the pallid countenances and frequent ill health, and not unusually the prostration and sometimes even the early death of the victims. The principal objects had in view in securing such quarters were, first, a central location, and secondly, as cheap rent as possible.

Soon after we took charge of this paper we called attention to this matter, and continued from time to time to urge a reform which was so much needed. Gradually was noticed a tendency in the right direction in this respect, and the reformation has made very commendable, and a more rapid progress than could have been anticipated.

Our attention has been called to this subject by the description of the new offices which have been recently fitted up in Baltimore for the occupancy of the Western Union Telegraph Company, furnished by a contributor in that city. This will be found of interest to the fraternity generally, and the more frequently our columns are occupied by such descriptions the better shall we be pleased. We judge from this description that the lines of our Baltimore brethren have truly fallen in pleasant places, and that they now have offices which are suitable for their occupancy, and which are a credit to the Company, and will prove attractive not only to them, but also to the public, upon whose patronage all telegraph companies must rely for success. In this respect the Western Union Company has set an excellent example, and one which may be profit-

ably and properly followed by other telegraph companies.

The change in this matter has been remarkable. We might instance many such improvements which we have recorded in the last three years. The most noticeable of these, as we believe it was the first, was the magnificent building fitted up under the direction of Gen. ANSON STAGER, for the Western Union Company in Chicago, and which was destroyed in the great fire. It has been restored, however, and that city is again favored with suitable accommodations for that Company, which again occupies quarters that are creditable to it and to all concerned. Gen. STAGER was a pioneer in this matter of providing suitable and pleasant telegraphic quarters, and deserves to receive the commendation of telegraphers as well as the public for it.

The new Western Union building now in progress of construction on the corner of Broadway and Dey street, in this city, is the most costly and magnificent building ever erected specially for telegraphic purposes in the world. It would seem as if it might provide adequate accommodations for any increase of telegraphic business for many years to come, but the telegraphic system grows so rapidly that it is impossible to predict, with any certainty, what its requirements may be three or four years hence. We printed last week an account of the progress which this splendid edifice had made towards completion, and shall endeavor to keep our readers informed in regard to it from time to time. Had any one predicted ten years ago that the time would come when one Company should find it advisable and necessary to erect such a building for the accommodation of its business, he would have been regarded as a visionary and enthusiast.

But not alone has progress been made by the Western Union Company. The other telegraph companies have also exhibited marked improvement in their surroundings. Every change in this respect has been for the better, and we look forward to the time, which we believe is not very distant, when there will be a consolidation of the companies competing with the Western Union into one organization, which will concentrate its main offices into a building, that, although it may not be as extensive or as costly as the new Western Union building, will be equally well adapted and fitted for its accommodation. Two telegraph organizations, national in their character, can be successfully and profitably maintained, and will prove advantageous to the fraternity and the public. Some kind of competition in the business will inevitably exist, and it is for the advantage of all concerned that the competitors should stand upon more equal terms than they can if one is a unit and the other divided into a number of comparatively small organizations, with, in some respects, divers and conflicting interests. - One and by no means the least of the advantages which may be realized from such a consolidation is the ability which it will afford, and the necessity which it will create for the provision of buildings adapted specially to the use of the consolidated competing companies.

There is yet very much to be done towards improvement in this matter of telegraphic office accommodation, but the progress which has been made and which is being made encourages hope for even more general and important results in the future. We could point out certain offices even now in use in this city which are totally unfit for such occupancy, but their number is decreasing. We congratulate the fraternity, the public and the managers of the telegraph companies upon what has been accomplished, and look forward with pleasurable anticipations for the future.

A Personal Talk with our Readers.

THE task of conducting a strictly class publication, such as is THE TELEGRAPHER, is by no means an easy one. It may seem to those who read each number as it appears, without any special knowledge or consideration of the labor and care required to prepare it, that there can be little difficulty in filling its columns with matter which shall interest its readers. A very brief

experience of editorial supervision and preparation would soon convince them of their error, and they would be less inclined to criticize and condemn its management than before such experience.

We are, perhaps, more painfully and humbly aware of the deficiencies of THE TELEGRAPHER than the greater number of its readers can possibly be. While we spare no labor, thought or effort to make it a credit to the telegraphic fraternity, whose representative it is, and to its conductor, who feels an honest and sincere pride in maintaining and improving its standard, yet at the best it is difficult, if not impossible, always to accomplish as much in this direction as is desired. We are always pleased to receive intelligent suggestions in reference to conducting the paper, and regret, rather, that we receive so few of them than as many as we do.

While we are not disposed to pander to any unreasonable or unworthy desire for mere amusement, or for sensational or denunciatory matter, we yet desire to treat of the topics and to furnish such matter as shall instruct and improve its readers. The object in view in publishing THE TELEGRAPHER, as we have often heretofore stated, is two fold: first, to afford instruction and information in regard to electrical science and the telegraphic art which shall be valuable and calculated to elevate the mental and professional standard of the telegraphic fraternity, and to furnish as complete a record as possible of telegraphic progress and what is done and proposed in telegraphy in this country and throughout the world, and also to publish such gossip and items as shall interest and amuse its readers. This we conceive to be the true idea of what such a journal should be. How nearly we succeed in carrying out this idea we must leave to our readers to decide.

Another difficulty experienced is the variability of the supply of proper matter, or what we consider proper for our columns. Sometimes we are overwhelmed with contributions and communications, and at other times there is an almost entire cessation of them, and we are compelled to rely almost wholly upon our unaided efforts in getting out the weekly edition. As we are practically confined to one subject, although it may be considered as having two branches—electricity and telegraphy and matters pertaining thereto—it is at times difficult, without repetition or the publication of matter either too scientific or technical, or of little or no interest, to fill the columns satisfactorily. The present editor has been writing several columns weekly for the last five years on this subject, and it is not to be wondered at, perhaps, that the mental mill should at times grind slowly and with difficulty, not experienced where there is a greater variety of topics to treat upon. We could easily fill our columns with some sort of matter pertaining to electrical science and telegraphy, but if prepared in this manner without careful and laborious selection and preparation, we do not think that the paper would meet with very general acceptance, or that its existence would be very prolonged.

We have thought it best to take our readers into our confidence, and explain to them some of the difficulties attendant upon the publication of a live telegraphic journal for two reasons: one, that they may judge leniently any defects which they may discover; and the other, that they may be induced to aid us by contributions and communications to maintain the character and variety of its contents. Whenever you have any suggestions to make which it is believed will be of general interest, or information to communicate in regard to electrical or telegraphic matters, we shall always be pleased to hear from you, and all such, properly authenticated, will receive careful attention and find place in our columns. Anecdotes and personal items, provided they are free from malice or uncharitableness, are always welcome, and serve to relieve the paper from too great heaviness, and afford spice, variety and interest to its contents.

Illness of Mr. F. L. Pope.

IN consequence of severe illness, Mr. F. L. POPE has been unable to prepare as yet a continuation of his

important series of articles on the Elementary Principles of Electrical Measurement, which have been received with so much favor by our readers. He has been and is suffering from a return of rheumatic disease, with which he was some years ago greatly troubled, but from which he had been free for some time. Its return was brought on by exposure which was unavoidable. He is now improving, however, and hopes to be about again in a few days.

Correspondents who may have failed to receive attention to their favors from him will understand the reason from the above.

The Swindling Tricks of Telegraph Colleges and Certain Telegraphers.

THE swindling Telegraph Colleges throughout the country do not confine their operations entirely to the victims whom they inveigle into paying them money for so called telegraphic education. A concern at Syracuse, N. Y., operating under the high sounding name of a "BRYANT and STRATTON Business College," after ordering an outfit for its telegraphic department from a prominent firm of manufacturers of this city, leaves them to whistle for their pay, even declining to return the goods when asked to do so. This is not an isolated case by any means, and we mention it as an illustration of the manner in which this nefarious business is rendered more profitable to the conductors.

We regret to be obliged also to add that it is not very uncommon for telegraphers, and even telegraph officials, to order goods, on the strength of their connection with responsible telegraph companies, and then coolly default in payment and leave their confiding creditors in the lurch. We have known of several such instances, and the only possible protection to dealers is to send C. O. D., unless those ordering are known to be honorable and honest. Even when so sent the party furnishing them is liable to be victimized for the express charges.

Another trick of these swindlers is to send for goods C. O. D. two or three times, which are promptly taken and paid for. Having established a sort of reputation, they then ask to have them forwarded without the collection being required on delivery to save express charges on returning the money, and this is sometimes the last that is heard from them. They have made their "little stake," and thereafter favor some other and perhaps rival establishment with their patronage on whom they play the same swindling game.

It is quite interesting to see the "black list" of telegraphic "beats" which the concern above referred to has, and which some day they promise to furnish to us for publication. The firm in question has always practiced great liberality with the fraternity, and the manner in which their confidence, and that of others in the same line of business has been abused, is not creditable to the craft.

The Interests of The Telegrapher.

A CORRESPONDENT, whose communication we publish on another page, makes a very sensible and practical suggestion in regard to the duty of telegraphers not to neglect the interests of THE TELEGRAPHER during the coming summer season. It is important that this suggestion should meet with the consideration which it merits. The summer months are usually not prolific of subscriptions, and we avail ourselves of the opportunity thus early in the season of calling the attention of the friends of the paper (and this should include every intelligent telegrapher) to the subject. The circulation of the paper has steadily increased for the past five months, but to maintain this desirable condition during the next three or four months will require special effort on the part of our friends. We trust that it will be sufficient to call their attention to this matter, and that the heart of the publisher may be made glad by practical evidence of appreciation on the part of those whose interests it is the object of this paper to advance. Procure and send in new subscriptions, as well as renewals of those which are expiring, and the advantage and benefits will be mutual.

The Telegraph.

The Cuba Cable.

THE break in the new cable between Key West, Florida, and Cuba, was located by Mr. Geo. B. Prescott, electrician of the Western Union Telegraph Company, about two miles from Key West, in the heavy shore end of the cable. It was probably caused by an anchor.

The break was found about a mile and a half from the shore, and repaired by Mr. Wm. Mackintosh, the foreman of repairs of the Western Union Company in this city. The cable was evidently cut by an axe, probably to clear an anchor of some vessel which had got fouled by it.

Soundings for the Pacific Cable.

DESPATCHES to the Navy Department, at Washington, report that the United States steamer Tuscarora, Commander Belknap, engaged in taking deep sea soundings, left Honolulu March 18, and arrived at Yokohama, Japan, April 27, having made seventy-two casts, the deepest of which was 3,287 fathoms. She will now examine the southeast coast of Japan, and from there carry a line of soundings to Tonoga, Aleutian Islands, and from thence complete the arc of the great circle to the point reached last fall from Puget Sound.

Foreign Telegraphic Notes.

THE German Reichstag is hereafter going to do its voting by telegraph. The wires are to be so arranged that each member can indicate his vote from his seat. In front of his seat are two buttons, one indicating yes, the other no. A pressure on the button telegraphs the vote to a circular table in front of the President's desk, upon which all the names of the members are written down, so that immediately after pressing the button each member can see a piece of paper appear under his name with his "yes" or "no" on it.

The Indo-European Telegraph Company announce that in consequence of urgent representations made to the Indian Telegraph Department the notice recently issued with respect to charging for compound words has been modified. The Indian Department will now accept as single words all ordinary English words, proper names of persons and places, which are commonly written and recognized as one word. When any *bona fide* doubt exists as to the proper mode of spelling an ordinary English word, the sender's manner of writing is to regulate the charge. All illegal combinations of words will be charged for according to the number of words employed in the combination, and illegitimate combinations of syllables with words will be treated as cyphers, five letters being counted as one word.

The expedition to complete the Brazil section from St. Vincent to Pernambuco of the Brazilian cables is under the command of Captain Halpin; and on his return to England he will undertake the charge of the Great Eastern to lay the new cable for the Anglo-American Company from Ireland to Newfoundland.

The repair of the 1866 Anglo-American cable will be effected about the middle of the present month, by which time it was expected the weather off the coast of Ireland will have moderated.

On the Budget night no fewer than half a million of words were transmitted over the wires from the Central Telegraph Station, London, between 6 P. M. and 2 A. M. Seeing, too, that a large quantity of this news had to be delivered to two or more newspapers in the same town, it is estimated that certainly not fewer than a million of words were so delivered throughout the United Kingdom during the period in question; so that the combined provincial newspapers of the following morning may be said to have contained five hundred columns of telegraphic matter relating to proceedings in Parliament on Thursday night. The transmission of this mass of news was effected chiefly by the Wheatstone instrument, of which as many as twenty-five were called into use on the occasion.

The *Journal Officiel de la Republique Francaise* of the 24th of April quotes from the *Economiste a resume*, which gives in figures the degree of activity of the electric correspondence in different nations for 1871: France, 7,447,000; England, 12,000,000 (not including 700,000 telegrams for the exclusive use of the press); United States, 12,404,000; Italy, 2,583,000; Switzerland, 1,517,000, not reckoning 109,000 despatches in transit and 35,000 service despatches; Germany, 7,108,000; Austria, 3,974,000; Belgium, 2,380,000; Holland, 2,050,000.

The Eastern Telegraph Company have announced the opening for traffic of their new cable between Italy and Egypt, *via* Zante and Candia. The company have now three cables working between Europe and Egypt, which is thus placed in direct telegraphic commuica-

tion with Great Britain, Spain, Portugal, Gibraltar, France, Malta, Italy, Greece and Turkey.

The report of the trustees of the Submarine Cables Trust, to the third annual meeting of the certificate holders, held on Wednesday, April 29th, in London, states that the revenue for the financial year, ending April 15, 1874, has amounted to £33,525 15s. 4d., and the expenses (limited by the trust deed to £2,000) have been £1,924 10s. 5d., leaving a balance of £31,601 4s. 11d.

The shareholders of the Western and Brazilian Telegraph Company have been invited to subscribe to £100,000 ten per cent. loan for twelve months, to enable the Central American Telegraph Company to complete the connections of the Western and Brazilian cables with the West Indies and New York. The loan is to be secured by a deposit of shares, and the Western Company guarantee its repayment.

THE traffic receipts of the Great Northern Telegraph Company for the month of March amounted to 366,851f. (£14,674), and for March, 1873, to 265,494f. (£10,620), showing an increase of 101,357f. (£4,054). The receipts on the China and Japan lines amounted to 157,030f. against 117,337f.; and on the European lines to 209,821f. against 148,157f. in March, 1873. The total receipts for the three months ending the 31st of March last amounted to 977,416f. (£39,097), and for the corresponding period in 1873 to 614,437f. (£24,578), showing an increase of 362,979 f. (£14,519).

The Mexican Telegraphs.

THE session of the Mexican Congress was reopened on the first of April at the City of Mexico. In his message President Lerdo, referring to the extension of telegraphs in the Republic, said:

"With a view of extending, day by day, the telegraph lines, the material on hand is being improved, another considerable quantity having been ordered. Special interest has been and will be taken in the construction of the long lines from Michoacan to Jalisco, San Luis to Durango, Durango to Chihuahua, Mazatlan to Guaymas, Tampico to Matamoros and Tabasco to Chiapa. We ought to expect that very soon the City of Mexico will be in communication by telegraph with all the capitals of the States and the principal ports of the Republic, the wire being carried afterwards to Lower California, for, from the investigations made, such a line seems very convenient."

Visit of Superintendent Gamble to San Diego, Cal.

Col. JAMES GAMBLE, General Superintendent for the Pacific Coast of the Western Union Telegraph Company, and Mr. R. R. Haines, of Los Angeles, Division Superintendent for Southern California, visited San Diego yesterday, returning by the *Orizaba* in the afternoon. Col. Gamble is an old printer and newspaper man, and, after a rest of twenty-five years, tried his hand at our press yesterday afternoon, and "worked off" in good journeyman style two or three sheets of the "outside" of this morning's *Union*. We learn that the special object of Col. Gamble's visit south is with reference to the proposed extension of the Company's lines to San Luis Obispo. When this connection is made we shall have the benefit of two lines from San Francisco.—*The Daily Union*.

The Extension of Telegraphy.

In a very able paper in the *British Quarterly Review* for April we find the following: "The enormous increase of facilities, which has taken place in recent years may also be judged of by considering the extent of the system as regards wires and apparatus. Twenty-two years ago, as we read in 'Chambers's Papers for the People,' the number of miles of telegraph in Great Britain was 3,000. At the time of the transfer of the system to the Post-office there were in existence 15,203 miles of telegraphic line and 59,250 miles of wire. There are at the present moment more than 20,000 miles of line and nearly 110,000 miles of wire; while the number of instruments, which stood at the time of the transfer below 2,000, has been increased to upwards of 8,000. The combined companies forwarded amongst them some six millions of telegrams, and their revenue would be somewhere about half a million sterling. In the first year of the transfer of the system to the Post-office the number of messages had risen to very nearly ten millions; in 1871 more than twelve and a half millions of messages had been forwarded; in 1872 the number had risen to close upon fifteen millions; while for the financial year ending 31st March, 1874, the number cannot be very far short of eighteen millions. The total estimated revenue for the year is £1,220,000, and there is every reason to believe that the estimate will be more than realized."

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

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New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended April 7, 1874, and bearing that date.

149,320—**GALVANIC BATTERY.**—Robert M. Lockwood, New York, N. Y. Application filed March 7, 1874.

Copper rests on sulphate of copper, zinc connected thereto by insulating pillars, so that their distance apart remains constant. Flexible skirt fastened to edge of copper, and bearing against sides of cell.

1. The copper plate *a* resting upon the sulphate of copper crystals, and connected to the negative pole by the column *e*, substantially as set forth.

2. The cone *c* above the plate *a*, and connected therewith and having an opening at the top through which the conductor *d* passes, substantially as set forth.

3. The skirt of felt or other flexible material applied to the cone *c*, and closing the space between the other portion of the cone and the cell, substantially as set forth.

149,527—**TELEGRAPH SOUNDER.**—Henry C. Royer, Cleveland, Ohio. Application filed March 3, 1874.

Electro-magnet itself vibrates, being provided with an extended core, pivoted at one end to a U plate.

1. A sounding instrument provided with a hinged or vibrating magnet, moved in one direction by magnetism and gravity, and in a reverse direction by a spring, substantially as herein described.

2. The combination, with the vibrating electro-magnet of the spring *K*, arranged beneath one projecting end of the core of the magnet, and the screw *L* passing directly through such end, substantially as described.

149,539—**TELEGRAPH SOUNDER.**—Henry Splitdorf, New York, N. Y. Application filed February 26, 1874.

Castanets or other sounding cups operated by armature lever.

The combination of sounding cups *E E'* with the armature lever of an electro-magnet, substantially in the manner and for the purpose herein shown and described.

For the week ended April 14, 1874, and bearing that date.

149,561—**ELECTRIC GAS LIGHTING APPARATUS.**—Edwin E. Bean, Boston, Mass. Application filed June 6, 1873.

A small Bunsen burner near the main burner is lighted by the electric spark when the circuit is closed and the gas turned on, and the blaze from it ignites the main burner, immediately after which the small burner is extinguished; all operated automatically by clock work and pneumatic apparatus.

1. In combination with the burner *g* and revolving Bunsen burner *f*, the three way cock *l*, operated by compressed air acting on the flexible diaphragm *p*, the rod *o* and lever *m*, as and for the purpose set forth.

2. The arrangement for automatically shutting off the gas from the burner *f*, consisting of the spring *r*, the rod *o*, pins *s* and lever *m* on the plug *h*, in a manner as herein shown and described.

3. The mechanism for operating the Bunsen burner *f*, consisting of the spring *11*, shaft *2*, ratchet *12*, pawl *14*, wheel *13* and pinion *15*, attached to the shaft *h*, or their equivalents, as and for the purpose set forth.

4. The combination of the escapement *16*, *17*, lever *18*, electro-magnets *6*, *7*, metallic plate *19*, with its spring *20*, and projection *21*, or their equivalents as and for the purpose set forth.

5. In combination with the metallic conductors *4' u'*, the movable rubber disk *1*, with its metallic disk *9*, operated by compressed air acting on the diaphragm *p*, rod *o* and coiled spring *11*, as herein set forth.

149,635—**GALVANIC BATTERY.**—Michael Breslin, New York, N. Y. Application filed November 4, 1873.

The copper or negative plate made in conical or pyramidal form, as set forth, whereby the operative surface is increased, as the sulphate of copper is consumed, as specified.

149,677—**ELECTRO-MAGNETIC ALARM.**—Frank L. Pope, Elizabeth, N. J. Application filed March 5, 1874.

Armature carrying two bell hammers acted on by two magnets alternately, the current being shifted after a full stroke has been made in either direction by one to the other.

1. The electro-magnets *M* and *M'* (either or both), the armature *m* and vibrating rod *D* in combination with the movable slide *K*, and insulated metallic slips *L L'*, substantially as herein specified.

2. The electro-magnets *M* and *M'* (either or both), the armature *m* and vibrating rod *D*, in combination with the hammers *H* and *H'* (either or both), and the bell or gong *B*, substantially as herein specified.

3. The rod *D*, provided with adjustable hammers *H H'* in combination with the bell or gong *B*, substantially as specified.

4. The adjustable metallic slips *L L'* in combination with the movable slide *K*, arranged and operated substantially as specified.

5. The adjustable set screws *G G'* so arranged as to regulate the travel of the slide *K* of the circuit changer *F*, in combination with the vibrating rod *D*, substantially as specified.

149,762—**TELEGRAPH INSULATOR.**—Charles L. Le Barron, Pensacola, Fla. Case B. Application filed January 16, 1874.

A telegraph insulator formed of a block of insulating material and provided with an aperture for the spike, having concave

ends to receive washers, and also provided with a circumferential groove at right angles to the spike aperture to receive the tie wire, as shown and described.

149,763—**TELEGRAPH INSULATOR.**—Charles L. Le Barron, Pensacola, Fla. Case A. Application filed December 31, 1873.

The insulator provided with a slot for the line wire, formed at a right or nearly right angle to a slot for a spike, and extending below the latter, as and for the purpose specified.

LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of

THE TELEGRAPHIC MANUAL.

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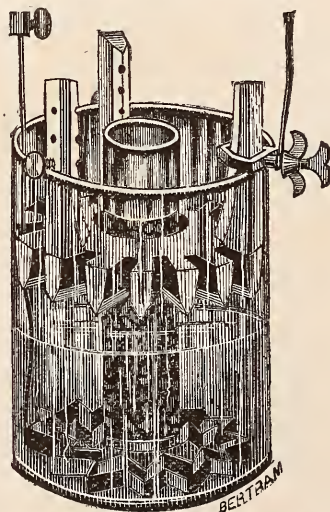
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covered by Ersted and manipulated by Schweigger, Ampère,
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plication of these discoveries for practical telegraphy by inven-
tors, from time to time.

Vol. IV.—A general history of the ancient and modern tele-
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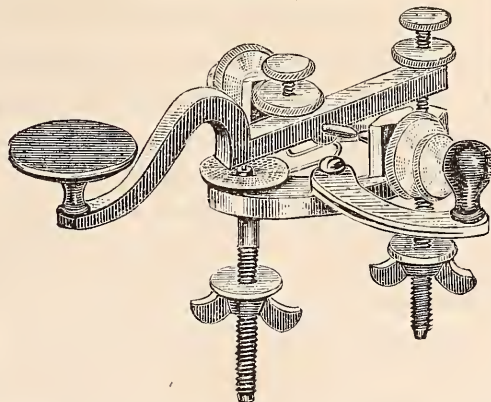
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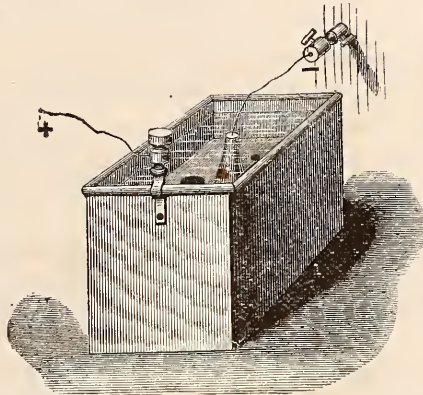
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POCKET RELAYS, in Hard Rubber Cases; new style.

BOX RELAYS, with or without Keys on base, a specialty;
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IMPROVED COMBINATION INSTRUMENTS for main line.

RELAY, SOUNDER and KEY on same base, making an ele-
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WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.

HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARREST-
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WESTERN UNION (new style) SWITCH BOARDS.

ELECTRIC BELLS, single or vibrating stroke.

MEDICAL INSTRUMENTS, cheap and reliable.

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VAUGHAN'S AUGURS and TOOLS in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID;
the finest in the Market.

TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER,
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SECOND HAND RELAYS, CUT-OUTS and REGISTERS very
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Repairing and Model Work promptly attended to.

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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
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Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
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Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.,

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM

AND

POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made.

Our CATALOGUE, embracing a large amount of new matter, and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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 22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

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A AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.

STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

Conductivity—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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 FOR
 RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY

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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH

in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,

which is the best watchman's time recorder in the world. Also,

ELECTRIC AND CONTROLLED CLOCKS

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CHRONOGRAPHS,

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ETC., ETC.,
 OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES
 OF
 EVERY DESCRIPTION,
38 VESEY STREET, New York.
 NEW AND SUPERIOR PATTERNS OF
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These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,

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In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOGGHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL
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For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, *nearly 2,000* have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:

Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00

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CHAMPION LEARNERS' APPARATUS,

with Complete Instructions, Battery, Wire, etc.,

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Batteries and Supplies of every Description.

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DR. L. BRADLEY,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS

FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.

Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES

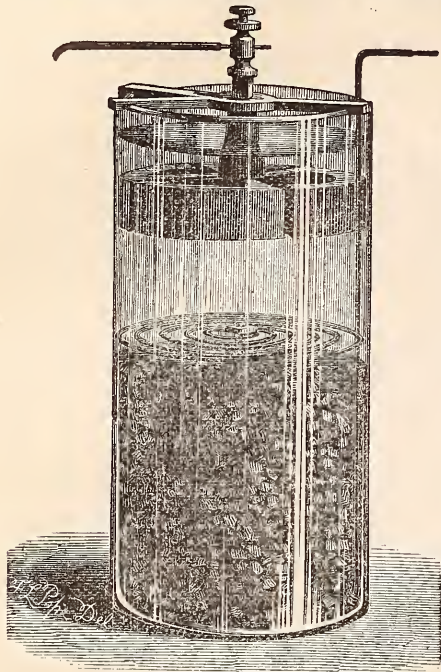
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1 800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1 150th to the 1 300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a
LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

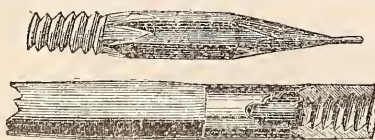
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8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

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41 Third ave., Chicago, Ill.

ANSON STAGER, Pres't. **ELISHA GRAY, Sup't.** **ENOS M. BARTON, Sec'y.**

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No. 220 KINZIE STREET, CHICAGO.

**TELEGRAPH, WIRES, INSTRUMENTS,
BATTERIES, TOOLS,
INSULATORS and SUPPLIES.**

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

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HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

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UNION BRAND, AND

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BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

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KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

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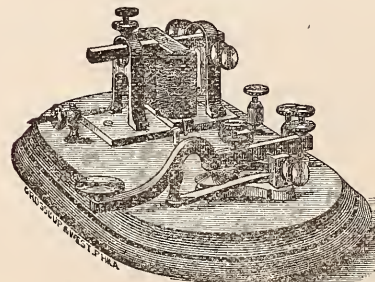
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THE PENNSYLVANIA TELEGRAPHIC AGENCY,

WAVERLY HEIGHTS, PENNSYLVANIA.

PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

If money be sent in advance by registered letter 12 00

Instruments without Battery 11 50

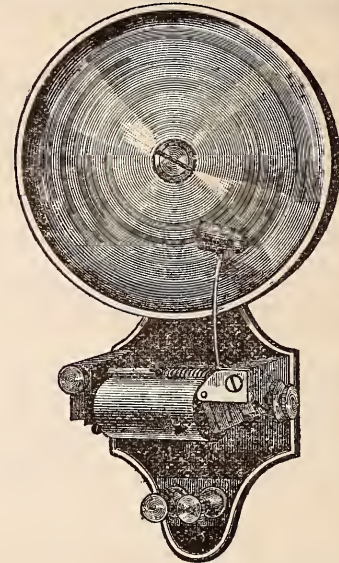
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132 WILLIAM STREET (rear),

Between Fulton and John Streets, NEW YORK.



One half of actual size

ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard. Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight..\$50 00

Sounders, from..... 4 50 to \$6 50

Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00

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PATENT ELECTRIC WATCH-CLOCK

THE BEST IN USE.

ELECTRIC BELLS AND ANNUNCIATORS,

At prices which defy competition.

Batteries of Every Description,

At unusually low prices.

Battery Carbons all sizes, with Improved Connection

MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS

AND PRICES EXTREMELY LOW.

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The Telegrapher

A Journal of Electrical Progress.

Vol. X. New York, Saturday, May 23, 1874. Whole No. 410

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MANUFACTURER OF
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OF ALL KINDS,
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JONES' PATENT LOCK SWITCH,
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PRINTING TELEGRAPH INSTRUMENTS.
ALSO, ON HAND AND FOR SALE,
D. W. PUTT & CO.'S Mechanical Telegraph
Instruments,
"Pope's Modern Practice of the Electric Telegraph,"
AND A FULL ASSORTMENT OF
TELEGRAPH MATERIALS AND SUPPLIES.
AT THE LOWEST PRICES.

CANADIAN TELEGRAPH SUPPLY
MANUFACTURING COMPANY,
MANUFACTURERS OF
All kinds of Electrical Instruments
AND
TELEGRAPH SUPPLIES.
All orders promptly filled, at reasonable prices.
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352 and 354 KING STREET, WEST,
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WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
Western Electric Manufacturing Company,
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CHARLES WILLIAMS, JR.,
(ESTABLISHED 1856.)
109 Court Street, Boston,
has for sale the various kinds of Office and Magnet Wires, including Cotton Covered, Silk, Gutta Percha, Painted, Fancy, and
DAY'S KERITE COVERED WIRE.

EUGENE F. PHILLIPS,
MANUFACTURER OF
REED & PHILLIPS'
PATENT INSULATED TELEGRAPH WIRES,
(PATENTED, NOVEMBER 18TH, 1873.)
Lock Box 169. PROVIDENCE, R. I.
Having recently enlarged our factory, we are now prepared to furnish at short notice any style and quantity of
BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.
Sample Card and Price List furnished when requested.

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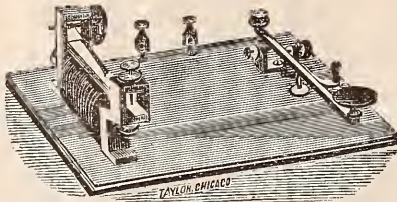
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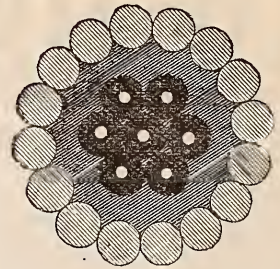
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MAY 23, 1874.

VOL. X.

WHOLE No. 410.

Original Articles.

[From *The Ghost of Telegraphica*.]

A Bashful Telegrapher's Mortifying Mistake.

BY BETA.

SOON after he began to study morse young Swaghead learned that of all the playful formulae adopted into or growing out of the telegraph business, "Take the other foot," from its preëminence in two kinds of humor, is by far the most popular. With a zeal contemporaneously shown in committing to memory many pages of "Abbreviations in use among Telegraphers," he seized upon and made it fondly his own to that extent that in the beginning he practiced sending upon that clause only, nor superseded it until its manipulation had been fully mastered. On the line where he fought it out that first summer his "Ki Se oser fool," — — — became even more familiar than "Scrutesofspeompany" is elsewhere. When an increased proficiency sanctioned his attempting transmission in the regular course of business, he fitted his pet phrase with special applications and used it more than ever; and for years, in one way or another, it served him daily. What it lost in novelty, as time elapsed, it regained in force of habit, and eventually it became endeared to him, through old associations, as recalling a past which was no less pleasant to look back upon than it had been hard to struggle through. But there came an hour when the poor wretch cursed it and the unknown rascal that invented it; when, so far from recalling boyish trial and triumph merely, it was fraught with horrible suggestions of a more recent and most miserable occurrence.

From that time forth his existence, telegraphically considered, was identified with frantic efforts to avoid sight or sound of the unhappy injunction. So intense in him was this new born hatred that it conquered at once and forever what had become almost a second nature. He never, by tongue or key, used the words again. But it was another matter to prevent others from addressing them to himself.

In his endeavors to that end, he grew into a system of sending so cautious and so painstaking as to induce a breaking up in almost every dot letter and a breaking down in almost every dash one. Yet the harder he strove the oftener the detestable syllables seemed to greet him. Up to this day they have pursued him like an avenging Nemesis. Compelled by fate, he still seeks to escape them, but he has long since abandoned hope. In his last days of beatitude—in those tranquil, happy hours when the entire English language was free to his use, and when no one of the hundred and twenty odd thousand words in the latest unabridged could call other than an innocent flush to his cheek or bring a pang of conscious guilt to his virgin heart—there were in young Swaghead's boarding house a dozen men and one woman. She, too, was young, and pretty, withal—which is more than could have been claimed for Swaghead. Naturally she formed the centre of attraction for their twenty-six eyes—counting her own. Swaghead was so lucky as to sit opposite her at table, and, whether from this conjunction or from that of their respective stars in the astrological firmament, it happened that her charming face—equally delightful when grave and when gay—and her divine form—as graceful in motion as at rest—made upon his susceptible heart a much deeper impression than on all the toughter ones of his eleven rivals put together.

Any man of the family but Swaghead, if blessed with at once such love and such opportunity, would have improved the latter in displaying the former by catering to his soul's idol; but he, although within easy reaching distance and where he could not help seeing just what was lacking on her plate, could never dare assist her to bread or pass her the casters, for the contemptible reason that he was too bashful. The utmost his courage ventured lay in surreptitiously feeding her little pet terrier with dainty scraps from his own platter. He dared not speak to her—he dared not look at her, except as if by accident. To this day, no doubt, she is ignorant of her conquest, unless, indeed, his downcast eyes and vivid blushes may have betrayed it. This weakness would seem to merit rather contempt than pity, but let us consider that the young man's

natural timidity was vastly augmented in this instance by his adoration of its object; that at the worst it was only a result of his innocence, his purity; that, moreover, it could have been dissipated by a little encouragement on the lady's part, for his bashfulness was like the cowardice of the rat, which disappears in a hopeless corner, or before the enticement of cheese. Young Swaghead attributed his failing to a supposed impossibility of inspiring with reciprocal regard the bosom of so glorious a creature, but he promised himself that did she ever display an interest in him his trepidation should vanish on the instant. In short, he was intensely, criminally bashful in so far as he could not take the initiative, and no farther. He huil slight hopes, however, on this hypothetic bravery, for never once by word or sign did she acknowledge his existence. Indeed, unprotected as she was in the company of strange men, it was incumbent upon her to assume a little extra dignity in self-defence. For weeks young Swaghead's furtive glances showed him no more than a dainty form rather erect, two close sleeved elbows very near to two black silk sides, a serene face hewed over a narrow collar and plain brooch, toward the plate, plump wrists showing their starched hands, and round, slender fingers plying the knife and fork. Until at last one day—one eventful day—when it happened that she and he stretched out their hands to the butter with such sudden simultaneousness, that before either could be checked they had well nigh met in the middle of the board. She caught his eye with an amused glance that electrified him into pushing over the dish with a bow; she pushed it back with a heavenly smile and a

"Do help yourself, sir."

"Let me assist you first, pray do," he rejoined, and held out a bit on the knife.

"Oh, thank you," she said, and, passing her plate, received it.

They smiled upon each other again, and then—under the table, beneath the safe cover of a cloth that reached nearly to the floor, he felt upon his foot a cautious timid touch—a gentle, lingering, thrilling pressure gone on the instant. Thinking it accidental he withdrew his foot a trifle and kept his eyes on his plate. In another second, to his supreme astonishment, he received a second touch, and then a third. There was a little tap, a light rubbing on the outside and on the in, then two little taps again, and then a warm, firm squeeze squarely on the toes. Young Swaghead had reached his corner! As the slangy English girls say, this was just the cheese! Before such warmth of encouragement the last vestige of his fears vanished as does the frost from pigs of iron left out all night when cast into the smelting furnace. Straight up his left leg into the very core of his inflammable heart crept a fiery impulse that quickened the whole man into new life. No longer a poor, bashful creature, albeit still a blushing one, young Swaghead felt that thenceforth he could hold his own; and at once he proceeded to put his new found valor to the proof. "If 'two heads are better than one,'" he reasoned, "four feet are better than two—where's her other foot?" And he stretched out his other and poked around till he found her little kid shoe quite over against her chair. He rubbed one side of it, he rubbed the other, he patted its rosette, and with a sly glance at his charmer over the board was going to pat it again when it was hastily withdrawn, its owner flashed an indignant stare upon young Swaghead, her chair was nudged back, she rose, and leaving her dinner unfinished, passed hurriedly from the room. When, after an interval, young Swaghead came out of his daze his very first impression was one that prompted him to carefully raise the cloth and peep under the table; for, although the lady no longer faced him, his left foot was still enjoying the familiar taps and rubbings. And there he saw the little Scotch beast gnawing away at a bene and squatting his hams on the convenient cricket an embroidered slipper afforded. As it chanced, I, myself, left that boarding house that very day and hour, so, of course, I know nothing further about the lady. But there is still a word or two more. If, among my readers, there are any who know young Swaghead, and who, out of some envious obtuseness, cannot translate his morse, I adjure them, by all that is merciful, to weigh with care the phrase in which they shall couch their criticisms. Let them bid him to "frite gorse" to their heart's content, or call him all the hard names in our common vocabulary, but not say to him as "X" says to me, as "V" says to me, as "Hm"—as "Sy"—as "Ro"—as "He"—as—Oh! curse and confound it—a whole dozen of alphabets say to me, "Take the other foot."

Cables and Cable Laying.

As it is probably less than twenty-five years since the first electric cable was laid, one is naturally struck with the very rapid progress which has been made in this department of telegraphy. Almost the first, if not the very first cables that were submerged were those

of the late Electric and International Telegraph Company, between Oxfordness and Scheveningen, generally known as the Hagne Cables. This was about the year 1850, soon after the incorporation of the company, and several of these cables are still in existence, and doing duty in different forms throughout the United Kingdom. Originally they were single wire cables, but having been superseded by others of greater capacity, and carried by a different route, they were fished up, twisted together so as to make four and seven wire cables, and laid down—one from the coast of Scotland to the north of Ireland, and another across the Frith of Forth from Granton to Burntisland. The greater portion of the last mentioned cable has been recovered within the past week or two, and it may be interesting to state, as bearing upon the important question of the "life" of a cable, that its condition was found to be comparatively good. Of course, in considering the "life" of a submarine cable, several circumstances have to be taken into consideration. The nature of the bottom along which it is stretched is all important, while the question of anchorage has an important bearing on the point. The latter would not, of course, affect deep sea cables; but it has had much to do with the damage done to those submerged close to our shores, and necessarily with that to which reference has been made between Granton and Burntisland. Here, however, the bottom is tolerably favorable to the duration of a cable, and to this circumstance is no doubt mainly due the excellent state of preservation in which some portions of the one in question were found. Necessarily, the life of a cable is simply the life of its outer covering or sheath, for the percha with which the core is covered may be said to be almost imperishable. In the cables to which reference has been made the outer sheathing was composed of homogeneous iron wire, which may, to a great extent, account for their excellent condition at this moment. But, of course, several new methods of covering have been introduced since the days of their manufacture; and it will be interesting to notice briefly one of the most recent efforts of manufacturing skill in the telegraphic field.

On Saturday the extensive works of the Messrs. Siemens, at Charlton, were thrown open to a select party of visitors, among whom were Lord Bury, Lord Rosse, Baron de Reuter, Professors Abel, Airey, Maxwell, Odling, Tyndall, and Williamson, Sir Charles Wheatstone, Mr. C. F. Varley, and Messrs. Culley and Preece, of the Engineering Department of the Postal Telegraph Service. These works comprise nearly every branch of telegraphic manufacture, but public interest becomes mainly centred on that part of the operations connected with the manufacture of submarine cables. Nor is there any difficulty in following the interesting process throughout; for you may commence with the raw material at one end of the large block of buildings and conclude with the finished cable as it is being taken on board ship at the other. Here, in huge piles, is the entire percha in its native blocks, for all the world like so many cart loads of mangold wurzel. The natives who collect this useful substance must have a keen sense of the ludicrous, for not unfrequently you come across a piece fashioned like a four-footed animal, or otherwise distorted into the most fantastic shapes. But, once passed through what is called the chopping machine, all inequalities are removed; and, after being subjected to the masticating process, it is gathered up in sieve-like shovels, and resembles nothing so much as a huge dish of mince collops. Then follows a second process of mastication by means of steam heated cylinders, which may be likened to the kneading of dough in the baker's trough, and, finally, hydraulic compression through very fine sieves, so as to crush out any atom of imperfection which may remain. The percha is now in a fit state to be applied to the wire of which it is to become the protector, or, to speak telegraphically, the insulator. The insulated wire is termed the "core" of the cable, and demands an amount of care and skill in the manufacture of which few people have any idea. The work in which the Messrs. Siemens are more particularly engaged at the present moment consists in the manufacture of a cable for the Direct United States Company, which is said to possess one or two peculiar features over any cable hitherto manufactured. The core is composed of a thick copper wire, encircled by eleven very fine copper wires, served with four coatings of gutta percha, and when complete measuring about three eighths of an inch in diameter. The usual form of core is a "strand" of copper wires—i. e., several small wires twisted together rope-like fashion; but it is thought that greater conductivity will be obtained by adopting the thicker central wires, although the core itself must necessarily, of course, be less pliable.

The coatings of gutta percha are applied from the soft mass of that material in contrast to the serving with India rubber, which is applied in long, narrow strips or layers. After the serving with gutta percha comes a serving with Manila hemp, which brings the core up to a thickness of 2-in., and then follows the sheathing with iron wire, which forms the outer cover-

ing of all. Ten iron wires are employed for this purpose, but before being applied to the cable they are each wound with five strings of Manila hemp, so as to impart greater strength, and, perhaps, to some extent, protect them from the action of water. This application is somewhat similar to what is called the "taping" of the iron wires, which has been effected in one or two cables recently manufactured for the Post-office, and which is said to increase somewhat the insulation of the cable, as well as to preserve the outer covering from rust and decay. The hemp covered wires are served with a species of black compound resembling tar or pitch, and after being twisted around the core, they are again served in this manner and finally whipped with Italian hemp, which, however, can scarcely be said to do more than hold the strands in their places until the whole becomes hard and dry. This is what is termed the deep sea portion of the cable. The shore ends are, of course, of varying sizes, graduating from about two and a half inches down to seven eighths of an inch. The testing arrangements are carried out with that care and elaboration which characterize similar operations in all extensive works of this nature. The core is tested coil by coil in tanks at 75° Fahrenheit, and the completed cable is afterwards tested as it is stowed away in the enormous tanks, of which there are no fewer than eight, each thirty feet in diameter, situated within the works. The core and cable testing are carried on in different rooms, and by altogether independent staffs of electricians; while there are constant tests being taken on behalf of the company for whom the cable is being manufactured by its own electricians. Observations are taken at regular intervals on Thomson's Reflecting Galvanometer. These are noted down on printed sheets by the electricians in attendance. Certain signs represent so many units of conductivity or resistance, and certain initial figures, worked out with marvellous dexterity on a calculating machine by a little boy, seem to indicate to the electrical mind all that is required to be known respecting the goodness of the cable. The complete cable is tested every ten minutes in the process of manufacture, and every half hour as it goes out to the ship, so that if a fault should escape unobserved, it is not for want of due effort to find it out.

The Faraday—the new ship to be employed in laying the Direct United States Cable—is undoubtedly a novelty in cable ships. Of this class of vessels, properly so called, there are comparatively few in existence. The Hooper, indeed, may be said to have been the first vessel specially built for cable work, for the Great Eastern and the numerous other vessels which have been employed in this service for some years past can only be said to have been converted to the special purpose, and some of them very badly converted, too. The Faraday is an iron ship of 5,000 tons register, but equal to carrying a gross burden of nearly 6,500 tons. She is 360 ft. long, 37 ft. deep, and has a breadth of beam of 52 ft. Her capacity for cable storage is immense, consisting of three tanks, two of which are 45 ft. in diameter, the other 37 ft. in diameter, and each 27 ft. deep. Five thousand tons of cable can be thus stowed away, and it is calculated that this will be equal to about 1,500 miles of the cable, which is now being taken on board. The testing room is situated in the angle between the two main tanks, so that the cable can be changed over at pleasure without greatly disturbing the paying-out arrangements. Both ends of the ship are alike, and as each is fitted with steering gear, as well as paying out machinery, the motion of the vessel can be reversed at pleasure, with the least possible delay to the work in hand. The cable machinery is on the combined principle—i. e., it can be made either to pay out or to pick up, as may be desired—and as the stern of the ship can be converted into its stem at any moment, any hitch in the operations can be remedied with a *minimum* amount of inconvenience and delay. Some scores of hands are busily employed night and day in storing the cable in huge snake-like coils in the different tanks; but as yet they are a long way from the deck of the ship, and many a turn will have to be given to the magic conductor before the topmost round is completed. In about a fortnight, however, the Faraday is appointed to sail with her first cargo, which will complete the line between a point in New Hampshire, about sixty miles north of Boston, and Newfoundland. Returning to England, she will take on board the remaining portion of the cable, which she will immediately proceed to submerge between Ireland and Newfoundland. The total length of the cable laid in the two operations will be about 3,100 miles, and it is expected that the whole will be completed about August or September next. The Faraday, it may be added, is the property of the Messrs. Siemens, so that she is destined to be employed in many expeditions similar to that on which she is appointed to sail towards the close of the present month.—*The London Times*.

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ASSESSMENT NO. 62, ISSUED MAY 15, 1874.—DEATH OF EDWARD P. REARDON.

EDWARD P. REARDON of Yonkers, N. Y. (certificate No. 793, issued March 21st, 1870), died April 27th, 1874, of paralysis.

Mr. Reardon allowed himself to become delinquent, but was restored to membership while in health, under the amnesty resolution passed at the last annual meeting.

Members holding certificates numbered up to and including No. 2,231 will please remit for above assessment.

Attention has been called to the last line on page 12 of the by-laws. Several members understand by it that they must remit direct to the Secretary. Members will please erase the line referred to. Its publication was a mistake. Remittances can be made direct to the Secretary, or to the agents, as members may prefer.

W. HOLMES, Secretary.
J. D. REID, Treasurer.

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21, 617, 667, 698, 787, 920, 1084, 1098, 1240, 1461, 1462, 1878, 1805, 1813, 1827, 1876, 1917, 1953, 1954, 1962, 1966, 1887, 2005, 2109, 2126, 2161, 2191.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 58, 59 AND 60, UP TO AND INCLUDING MAY 12.

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ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 61, UP TO AND INCLUDING MAY 12.

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MISCELLANEOUS.

58.—916, 1269, 1488, 1907, 1915.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Telegraphic Matters in Central America.

SAN SALVADOR, C. A., April 22.

TO THE EDITOR OF THE TELEGRAPHER.

In reply to your favor, which was received on the 20th inst., it will give me pleasure to furnish you all the telegraphic information from this section in my power.

For the present I can only say that we are now at work on the line to connect this State with Guatemala, and that I expect to complete the section which appertains to us in all this week. How soon the other party will be ready I cannot say, but expect it will be very soon, as they are well advanced in their work.

We have at present in operation twenty six stations, with an extension of four hundred and ninety-two miles of wire, of which one hundred and ninety-two are wired with "Johnsons' No. 9, insulated with glass insulators, and three hundred carrying No. 11 wire of the same makers, and Brooks' paraffin insulators. Of this line I find the wire too small for the work it has to do, and the iron hooks of the insulators certainly burn the wire, particularly in the rainy season, when the discharges of atmospheric electricity are heavy. On account of the heavy discharges of atmospheric electricity I have introduced, and use the Globe Lightning Arresters, which are manufactured by F. L. Pope & Co., and which are found to be a perfect security and far superior to the flat plate arresters. For batteries, I use, on the Western lines, Chester's dilute sulphuric acid battery; and on the Eastern, Hill's gravity battery, No. 2. I have found the first very superior to the other, especially with the native operators, who are not especially attentive, although they are not slow in learning to operate, most of them reading by sound.

The paragraph in THE TELEGRAPHER about the penal laws against the destruction of the telegraphs by the people, only exist in the imagination of the writer. Perhaps there is no country where the people care for the preservation of the wires more than here, although when first put up they gave us a great deal of trouble in this respect. But that has been corrected, and at the present time the severe electric storms to which this region is subject, are the principal and most destructive enemy of the telegraph lines.

There was a project introduced of laying a cable to connect Panama with all the Central American ports, but when the estimates for such a cable were obtained from England, the cost startled the Government, and the project has been abandoned, for the present at least.

During the ensuing dry season I am in hopes we shall see a telegraph in course of construction in Nicaragua. We also propose to extend our lines to Camayagua in Honduras, so it will be seen that we are not idle, and there are few towns in this State where the clicking of the telegraph instruments cannot be heard; and it may well be considered that, taking into account the poverty, and the so lately disturbed state of the country, we are as well to the front in telegraphic progress as could be expected.

A. MAURY.

The Proposed Society of Electricians and Telegraph Engineers.

PROVIDENCE, May 13.

TO THE EDITOR OF THE TELEGRAPHER.

The movement inaugurated by Mr. I. N. Miller I believe to be a good one. That's just what we want—a society for the interchange of thought and experience. I have long wanted to see something of that kind started, for I believe, if managed rightly, it can be made productive of great good. Even those already well versed in electrical matters might find something new and useful.

Notwithstanding the rapid progress which has been made during the past twenty years in the discovery and application of the principles of electricity, I think every one will agree that it might have been far greater had there been some stimulus for investigation, and as you very truthfully remark in your editorial of the 9th instant, some method is required for preventing the waste of time and energy in studying over and experimenting on theories that have been already thoroughly examined by others. Most of us recall an illustration of such wasted energy in the early life of Sir Humphrey Davy, who, soon after commencing his experiments in chemistry, discovered that he was simply making discoveries already known, and then hastened to acquire from books and by association with scientific men a knowledge of the science as far as then developed.

The Telegrapher in Boston.—How it stands a Comparison with other Telegraphic Papers.—A Prediction.—Removal of the Western Union Office.—Personal and General.

BOSTON, May 22.

TO THE EDITOR OF THE TELEGRAPHER.

WHILE I do not see as many copies of THE TELEGRAPHER hereabouts as would be agreeable, I am free to say that its merits are not overlooked by the best men, for all such either take it or exchange some secular sheet for it with those who do take it, and so come to know its contents. I, for one, would not be without it, and it is with pride that I watch it steadily holding its own—not to say advancing—while the lesser specimens of telegraphic journals, which seem to have become an epidemic in the West and in New York, have their little day of triumph and then are gone, practically, for no one cares for them. There was one honest attempt, perhaps, made in New York to publish a telegraphic paper without advertisements (your modern operator seems to think advertisements are an objectionable feature), and it was not so great a success that its publisher—a newspaper man, too, I understand—cared to resume it after circumstances had compelled him to abandon it temporarily. But the old proverb, maintaining that "fools rush in where angels fear to tread," is as applicable now as ever; and, despite the lesson which this episode in class journalism teaches, men, with no appropriate training or capacity that I have been able to discern, with no brains, that have yet manifested themselves, to edit, or taste to revise a newspaper, have stepped forward and propose to foist upon the fraternity from the same city a spurious article. There may be those in our ranks who have no choice between a budget of twaddle in the shape of correspondence and a first class telegraphic journal edited with ability, but the intelligent members of the fraternity have a choice, and their influence is likely to be felt to that extent that THE TELEGRAPHER will keep on its dignified way long after the pretenders, without ever having ruled, shall have flourished and passed away. It is in the nature of things that what is good shall endure and what is abortive shall pass out of mind and perish. It is only a question of time. Will some one be so kind as to cut this prediction out and paste it up for future reference? Thank you.

I didn't mean to say this when I commenced, but it would come out in spite of me. I thought a few words of news from this locality would look well in your paper, and to give it was my intention, so you may cut off that first paragraph, if you don't like it, and I'll never think of being affronted.

The Western Union still flourishes at No. 83 State street, but the time draws near when we shall remove down the street a bit, and go into other quarters. We shall stay there two or three years, I am told, at the end of which time we shall make a permanent change, taking up our habitation in a new building soon to be put up on the corner of Pearl and Milk streets.

There is very little changing here compared with New York, Chicago and other large cities. Our Superintendent, Mr. C. F. Wood, is still with us, and changes but little. Unquestionably, he is one of the finest looking old gentlemen in Boston. Mr. Milliken continues to rule telegraphic destinies in the operating room, assisted by John Duxbury and Charlie Henderson, two of the oldest of the old stagers; Devereaux, McGee, John Milliken, Park Allen, and a good many of the old force who have been here ever since the high toned days when Gerritt Smith, of No. 145 Broadway, H. H. Ward and others sat down and took business like the rest of us. Mat Davin and his brother, T. A. Davin, as well as Beardslee and Stevens, are still with us.

In the branch offices, too, there are many of the Argonauts still pegging away, but doing it so quietly that one scarcely hears of them. Tom Calahan and Ben Winter, the latter the manager, are at the old State House, and Charlie Sawyer is manager for the Franklin, at No. 31 State street, an office with a history extending back as far as that of No. 21 Wall street, in your city. The Western Union gave up this office a year or two ago, and the Franklin "went for it then and there," to use a classic phrase of Mr. John Hays. Mr. Roche is manager of the Franklin main office, and Suel Smith has charge of the business of the Gold and Stock Telegraph Company. Our night manager at No. 83 State street is Mr. E. F. Leighton, and our force of artists includes Sam Eldridge, C. F. Finch, Horatio J. Colson, William McFarland and others.

Tom Maguire, an old time operator, is a celebrity hereabouts, and knows everybody. He is as fond of telegraph operating as a muskrat is of young ducks, and invariably proceeds to the telegraph office to write his dispatches for the New York Herald, of which he is the New England correspondent. Indeed he says he couldn't write a "special" on anything but the back of a telegraph blank, and his practice certainly conforms to this theory. Tom is a good fellow, and the "boys" are always glad to see or hear from him. This,

I believe, finishes up about everything of interest at present, so I will close, intending to call again. OLD CAMBRIDGE.

Congress and the Telegraph.

WASHINGTON, D. C., May 20.

TO THE EDITOR OF THE TELEGRAPHER.

THE indications that the heats and discomforts of summer are near at hand, has set our Congressional Solons to hurrying up business and preparing to get away from this city at as early a day as possible. Both Houses have adopted a resolution to adjourn on the 22d of June, and it is not probable that the session will be prolonged much beyond that date.

In the Senate on Monday last Senator Frelinghuysen, of New Jersey, introduced a bill to give a Mr. Moreno and certain New York and California associates the right to construct and maintain a line or lines of telegraph cable to connect the American and Asiatic coasts, on condition that the work of laying the cable shall be begun within three years from the enactment of the bill. The bill also provides that the Secretary of the Navy shall be authorized to detail one or more steam vessels to be at the disposal of said company to assist in the surveys, in laying and submerging the cable, transporting materials, and generally to afford any assistance calculated to promote the success of the enterprise. This was referred to the Committee on Commerce.

On the same day Mr. Starkweather, of Connecticut, introduced Cornell Jewitt's bill in the House, which is similar to the one pending in the Senate. Until there is some evidence of something behind Messrs. Jewitt and Moreno more substantial than has yet been shown, their chances for obtaining valuable franchises are pretty small.

The electric gas lighting patentees seem to be having some trouble, a suit having recently been entered by Dr. John Vanbrunt against John W. Thompson and others, composing the Electro-Magnetic Gas Lighting Company, to obtain a reassignment of the patent on the ground that they have not fulfilled their agreement. CAPITOL.

Miscellaneous.

ELONGATION OF CONDUCTORS BY ELECTRICITY.—

Various physicists have from time to time studied the modifications in the molecular state of the conducting wires, due to the passage of the electric current. Wertheim arrived at the conclusion that the transmission of the current modified the elasticity of the conductor, but Edlund, on the contrary, by a series of careful experiments, has determined such not to be the case. This latter investigator has found, however, that the elongation of the wire under the influence of the current is sensibly greater than the dilatation due to the elevation of temperature resulting from the passage of the electricity. Two calculations were made of the temperature of the wire, one deduced from the relation previously established between the galvanic resistance of the conductor and its temperature, the other from the elongation of the wire directly measured and of its coefficient of dilatation, equally known. The second mode of determining the temperature constantly gave higher figures than the first, and M. Edlund therefore concluded that the current produced a special elongation in the conducting wire which is added to the expansion resulting from the accession of heat.

Quite recently M. Streintz has taken up this subject, and, by further investigation, has sought to measure accurately the galvanic elongation for different metals.

The observations were made on wires 0.019 inch in diameter and 21 inches in length, the ends of which just touched two levers which carried mirrors placed in the prolongation of their axis of rotation. The divisions of a graduated scale were reflected in the mirrors, and thus the displacement of the extremities of the wires could be accurately read. All the wires, except those of hard tempered steel, showed a marked excess of expansion under the action of the current, which varied according to the different metals, from 11 to 27 per cent. of the dilatation of the wire under the action of heat alone when brought from the normal temperature, 68° Fah., to that fixed as a limit, 131.4°.

M. Streintz sums up his results as follows: 1. The galvanic current causes no other modification of the elasticity of a conducting wire than such as results from the elevation of the temperature produced.

2. Under the action of the current, the conductor expands more than when it is carried to the same temperature without the current; tempered steel alone does not present this excess of dilatation.

3. Galvanic dilatation does not manifest itself immediately on the closing of the current, but gradually, as does caloric expansion.

4. Galvanic dilatation is not the consequence of an electrodynamic repulsion, but probably results from a calorific polarization, or an orientation of the calorific vibrations.

Erroneous Formulæ for Testing Telegraph Lines for Mileage Insulation Resistance.

CELLICOTHE, O., May 18.

TO THE EDITOR OF THE TELEGRAPHER.

AS MR. HASKINS has not come to the rescue of his rule for finding the mileage insulation resistance of different sections of a wire when tested from a single station, it is fair to presume that he has no defence to make, and has allowed it to go by default. Mr. Haskins' rule is not the only one subject to criticism. Varley's formulæ, for instance, gives equally erroneous results in certain cases. In fact, these rules and formulæ will give approximately correct results in some instances, while in others they are totally unreliable. For example, we will take a line 110 miles long divided into two sections of 100 and 10 miles respectively.

A 100 B 10 C

Testing from A with B open = 10,000 ohms, with C open 6,000 ohms. Solving, according to Haskins' rule, we get for mileage insulation A-B = 1,000,000, A-C = 660,000, B-C = 626,000. A glance at these results will satisfy any one of the incorrectness of the mileage insulation of B-C. In fact B-C should be not far from 150,000 per mile instead of 626,000.

Again—Take another case, which is an actual test taken from record book.

A B C

A to B 60 miles, B to C 37 miles.

Tested from A with B open = 31,800 ohms, with C open = 8,400 ohms, wire resistance, 18 ohms per mile. Solving, according to Varley's formulæ, we have the following results:

A to B, mileage insulation = 1,875,600 ohms.

A to C " " = 730,119 "

B to C " " = 1,512,819 "

Here we have one section of line giving a mileage resistance of 1,875,600 and the other section 1,512,819, but both sections tested as one only gives 730,119 ohms per mile. The true resistance of B C in the above case is not far from 425,000, instead of 1,512,819. The rule generally employed in practice is, "Divide their product by their difference." This rule is accurate enough for almost all practical purposes, and is far preferable in ordinary testing to either Haskins' or Varley's rules. It is, however, based upon an erroneous supposition, viz., that the result obtained by testing from A with C open is the joint resistance of the insulation of the two sections B A and B C. To arrive at this joint resistance accurately by measurement it would be necessary to connect both sections together, and make the test from B instead of A. The difference between the tests made at A and B on wires of no very great length is not great enough ordinarily to seriously affect the result. It is possible to ascertain accurately the mileage insulation of different sections of a wire by testing from a single station, but the solution involves a high degree of mathematics, and is too complicated for practical purposes. I. N. M.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE

TELEGRAPHIC FRATERNITY.

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The New Telegraph Cables in Progress and Proposed.

AS WILL be seen by reference to our news columns the SIEMENS BROTHERS' new cable steamship Faraday has completed the loading of the first part of the new Atlantic Telegraph Cable, and sailed from Gravesend. It is understood that the section of the cable between Rye Beach, New Hampshire, Nova Scotia and Newfoundland is first to be laid, and then the Faraday will return to England and take on board the additional cable required to complete the line from the Irish Coast to Newfoundland. We do not understand that the United States Direct Cable Co. propose to land their cable at Newfoundland at present, the exclusive right acquired by the Anglo-American Telegraph Company, through its consolidation with the New York, Newfoundland and London Telegraph Company to land and operate telegraphs on that coast, not having yet been legally abrogated. In fact, it is claimed by the Anglo-American Company that it cannot be, except by the purchase by the Newfoundland Government of its entire telegraph property, including not only the lines in Newfoundland but its Ocean telegraph cables and appurtenances as well. This position is contested by the Provincial Government, and, until it is decided, the company maintains its exclusive occupancy of the coast for telegraphic purposes. We are informed that the new cable will, for the present at least, be buoyed off that coast and its first Western station be established in Nova Scotia, where no exclusive concessions interfere with its being done. Unless some mishap should occur, we may expect within a few weeks to see established that competition in Atlantic telegraphy about which so much has been said and written heretofore by discontented patrons and newspapers in this country.

We must confess that we did not for some time regard this cable as likely to be finally laid, but supposed that at some stage in its progress it would be disposed of in some other direction, as was the case with the Great Western Telegraph Company's Cable, which, when about completed, was sold out to the Western and Brazilian Company. In this we have been proved mistaken, and, except for some unforeseen obstacle, we have now no doubt but that the competition in Atlantic telegraphy will soon be in actual existence. Whether it can with a single cable actively and successfully compete with the Anglo-American Company, which

has four cables, and is soon to have a fifth in operation, remains to be seen. The new cable company will labor under some other serious disadvantages, but we do not care to discuss them at this time. As an honest competing enterprise it will have the good will of THE TELEGRAPHER, and its best wishes for its practical and pecuniary success.

As we have before stated, contracts for a term of years have been made between the new cable company and the Franklin, Atlantic and Pacific, and Southern Atlantic Companies, which, together, will contribute a considerable amount of business to the new line.

The additional cable required to lay another cable for the Anglo-American Company is being manufactured, and the Great Eastern, under the command of the veteran Capt. HALPIN, will, during the next few weeks, be once more engaged in adding a new electric cord to those which already connect this Continent with Europe. The Anglo-American Company has always shown much wisdom in its management, especially in the matter of providing facilities for its increasing business in advance of the requirements therefor. A total interruption of communication by its cables, or those under its management, or in connection with it, has never occurred since the company was first organized, and its cables in operation. There is little probability for such an interruption now with the number of cables it has in service. We presume that when the opposition cable is laid and in operation there will be some reduction of rates by the Anglo-American, but to what extent we are not as yet advised. It has been understood that one form which this reduction was to take would be a classification of business, similar to that of full and half rate messages which has proved so successful on the land lines in this country. This would be a politic movement, doubtless, and might prove advantageous both to the company and its patrons.

The U. S. steamship Tuscarora is still actively engaged in taking soundings of the routes for a telegraph cable between the Pacific coast and Japan and China. No company has yet been organized for laying this cable, but it is said that English capitalists are ready to furnish the cable and the capital when the best route is determined, and under suitable concessions from this Government. The utter and apparently unconquerable disinclination of American capitalists to invest in ocean telegraphs gives English capitalists the almost exclusive control and management of the telegraph cable interests of this country, as well as of Europe and the East. The Pacific cable is a necessity, and will undoubtedly be laid in due time, and almost as undoubtedly be owned and controlled in London. We may regret this as deeply as possible, but past experience has proved that our capitalists will not invest their money in such enterprises. In view of this fact the farce which is being enacted now in Washington by a certain well known blatherskite, in relation to Congressional action in regard to a Pacific cable, and a grant to one set of English capitalists as against another as a matter of national interest and importance is absurd. In this he has two purposes—one to maintain a cheap notoriety and the other the hope of obtaining something which he can sell out in England. That he can by any possibility succeed is an idea which reflects severely on the wisdom, or even common sense, of Congress. His reputation is so well known here, and he has been so constant and infortunate in his efforts to obtain grants and concessions from Congress for schemes either utterly impracticable or mercenary in their character, that the Senator or Representative who does not estimate him at his true value and rate his importance as it deserves must, indeed, be inexperienced and fresh from the rural districts. We notice that the act pending in the Senate has been introduced in the House, as he probably finds it impossible to obtain sufficient notoriety from the former body. The so-called act to which we refer is undignified, absurd, illogical and ungrammatical, but it serves its purpose in bringing its author and proposed beneficiary before the public. If there is a real competition for concessions for a Pacific cable the successful party must have some other

spokesman and representative at Washington; but we do not suppose that Congress will take any action on the subject at the present session, which is now drawing to a close.

The New Compulsory Education Law and the Telegraph Messengers.

THE Legislature of this State, at the session which has recently closed, passed an act providing for compulsory education of all children resident in the State between the ages of eight and fourteen years. This act has been signed by the Governor and has become a law, and will take effect on the 1st of January, 1875. It is very stringent in its character, and is likely to cause great inconvenience to the telegraph companies, and especially the American District Telegraph Company, which employs at the present time in this city and Brooklyn, upwards of 400 messengers, of whom probably nine tenths are within the age affected by the law.

The first section of this act provides that:

"All parents and those who have the care of children shall instruct them, or cause them to be instructed, in spelling, reading, writing, English grammar, geography and arithmetic. And every parent, guardian, or other person having control and charge of any child between the ages of eight and fourteen years, shall cause such child to attend some public or private day school at least fourteen weeks in each year, eight weeks at least of which shall be consecutive, or to be instructed regularly at home at least fourteen weeks in each year in spelling, reading, writing, English grammar, geography and arithmetic; unless the physical or mental condition of the child is such as to render such attendance or instruction inexpedient or impracticable.

The second section provides that:

"No child under the age of fourteen shall be employed by any person to labor in any business whatever during the school hours of any school day of the school term of the public school in the school district or the city where such child is," unless the child shall have attended some public or private day school, or been regularly instructed at home in the branches provided in Section 1, at least fourteen weeks of the fifty-two weeks next preceding any and every year in which such child shall be employed; the child shall, at the time of such employment, deliver to the employer a written certificate, signed by the teacher or a school trustee of a district or of a school, certifying to such attendance or instruction. Any person employing a child contrary to these provisions shall, for each offence, pay a penalty of \$50 to the treasurer or chief fiscal officer of the city, or supervisor of the town in which such offence shall occur, the sum to be added to the public school money of the district in which the offence occurred."

The law is so stringent, the penalty so severe, and the manner provided for its enforcement so practical that there seems to be little chance for the evasion of its provisions. It was the evident intention of the Legislature that there should be no opportunity afforded for any exception to its enforcement save from mental or physical incapacity, which would equally prevent the employment in any remunerative manner of the child.

We do not propose to discuss the advisability or propriety of this act, but to consider its probable effect upon the telegraph companies who are large employers of such young persons, and whose service requires constant attention from such employes. A careful examination of the sections, whose substance is given above, will show that there are only two practical methods which can be adopted by those employing a large number of youths within the prescribed ages as a solution of the difficulty. One is to give up the employment of all who are under fourteen years of age, which in the case of the telegraphs, as has been indicated, would necessitate a reconstruction and reorganization of very nearly their entire force; and the other the establishment of private schools at convenient hours, for the attendance of the employes, for the prescribed time. Either of these methods would entail considerable additional expense. It will be seen by reference to the first section that it affords opportunity for the adoption of the latter alternative by employers.

The tenth section provides that two weeks' attendance at half time or at evening school, shall be counted as

equivalent to *one week's* attendance at a regular day school.

This law will, we think, be found of great importance to telegraph companies, and is likely to introduce some complications in the details of the business in this State.

Return of President Orton.

Mr. WILLIAM ORTON, President of the Western Union Telegraph Company, sailed from Liverpool in the steamer of Friday of last week, with his wife, on their return home. Their return has been hastened by the illness of Mrs. ORTON, who has been very much prostrated by the journey and the severe domestic affliction in the death of their youngest son, which was noticed in THE TELEGRAPHER some weeks since.

We understand that Mr. ORTON's health has been somewhat improved by the relief from the pressure of his labors and responsibilities, but is not so thoroughly reestablished as was hoped when he went abroad.

The Automatic Telegraph Company.

THE Automatic Telegraph Company have recently established a number of additional auxiliary offices in this city, so that persons who desire to avail themselves of the cheap rates for telegraphing established by this Company, and their facilities for prompt and rapid transmission of business, can find accommodations for so doing without the necessity of visiting the main office. The advertisement of the Company, which will be found in this paper, will show the comparative cheapness of their charges for telegraphic service, and the location of the offices.

We understand that the Automatic Company is being very liberally patronized, and gives much satisfaction to its customers by the promptness and reliability of the service rendered.

Resignation of Mr. H. L. Hotchkiss.

Mr. H. L. HOTCHKISS, who has been Secretary and Treasurer of the American District Telegraph Company since its organization, has resigned those offices to engage in other business. At a meeting of the directors of the company, held on the 30th of April, the resignation was accepted, and complimentary acknowledgment was made of the ability and fidelity to duty of Mr. HOTCHKISS. Mr. GREENLEAF was chosen to succeed him as Treasurer, and Mr. C. B. HOTCHKISS was appointed Secretary and Assistant Treasurer.

Mr. H. L. HOTCHKISS, who, as Secretary and Treasurer of the Gold and Stock Telegraph Company, and of the American District Telegraph Company, has been connected with the telegraph business for several years, has been admitted to a seat in the Board of Brokers, and has opened an office for the transaction of a general brokerage business at No. 32 Broad street, room 57. He makes a specialty of telegraph stocks, with the values and prospects of which he is thoroughly familiar. He will, no doubt, obtain the success in his new vocation which his ability and merit so well deserve.

Personals.

Mr. J. B. NUGENT has resigned the position of telegraph operator for the Philadelphia & Erie R. R. Co. at Langdon, Pa., and accepted a position with the Pittsburg & Connellsville R. R. as agent and operator at the Bridgeport, Pa., Station.

Mr. W. H. PARSONS has been appointed manager of the Western Union Telegraph Company at Batavia, N. Y.

Mr. ELLIS H. HOLROYD has been transferred from Racine (Wis.) depot to the Chicago office of the C. & N. W. Railway.

The statement in the "Personal" column for April 25th that Mr. R. J. HEWITT had been transferred from the Kansas City, Mo., to the Milford, Mo., W. U. Telegraph office was erroneous. He resigned his position at Kansas City, and has gone to his home at Milford, where there is no telegraph office, for a rest.

Mr. FRANK GLIDDEN has resigned his position at

Lake City, Fla., and is on his way home, to visit his kindred in New England.

Messrs. JOHN & M. J. DORAN, of the cable room at No. 145 Broadway, have both been transferred, at their own request, to Plaister Cove office of the Western Union Company.

Mr. L. E. WELLER is temporarily filling the position at No. 145 Broadway, vacated by Mr. STEPHEN G. SAUNDERS. Mr. SAUNDERS left for San Francisco and Hong Kong on the 19th inst.

Mr. FRANK STEWART, familiarly known as "Fatty," has returned from the wild west, and after paying his respects to Boston, has come back to New York. He is working nights for the A. & P. and Franklin Cos. at 198 Broadway, New York.

Mr. A. L. SEYMOUR, late of the P. & A., is also working at 198 Broadway, *vice* Mr. JOHN MORELAND, gone West.

Mr. GILBERT, manager of the Western Union office at 134 Pearl street, has gone home to recuperate his failing health. Meantime Mr. R. J. CAHILL is acting as manager, the latter's position being filled by Mr. ERVING S. FITCH, of the night force, at 145 Broadway.

Mr. R. J. HEWITT has accepted a situation as extra operator on the Atlantic and Pacific Railroad.

Mr. O. L. PERRY, recently transferred from the Canton, Ohio, Railroad to the Western Union city office same place, has been promoted to manager of the Fort Wayne, Indiana, Western Union office.

Mr. ERDMAN, of St. Petersburg, Pa., has accepted the position in the Canton, Ohio, Western Union city office, vacated by the promotion of Mr. O. L. PERRY.

The Telegraph.

By Cable.

THE UNITED STATES DIRECT CABLE.

LONDON, May 18.—The steamer Faraday, with a portion of the new Atlantic Telegraph cable, of the United States-Direct Cable Company, has sailed from Gravesend.

The New Telegraph Line of The Great Southern Railway.

THE Savannah, Georgia, *Morning News* of a recent date, says: "Jacksonville is enthusiastic over the prospect of cheap rates of telegraphy. The Great Southern Railroad will construct a telegraph line along its route which will probably connect with the Southern Atlantic Telegraph Company at Jessup. This line is in course of construction now. Twenty five miles of the poles are already up, and the entire distance between Jacksonville, Florida, and the Satilla River, Georgia, will be ready for the wire in about two weeks." It is expected that the line will be completed by the first of August. Mr. Paul W. Bossart, formerly of New York, is the Supt. of Telegraphs and the line is being constructed under his supervision and direction.

Telegraphic and Electrical Brevities.

At the annual meeting of the stockholders of the Pacific and Atlantic Telegraph Company at Pittsburg, Pa., on Tuesday, May 5, Mr. William Orton was elected President, and the following named gentlemen Directors, for the ensuing year: Messrs. George H. Mumford, Norvin Green, Roswell H. Rochester, of New York; William G. Johnston, of Pittsburg, Frederick V. Beisel and David H. Bates, of Philadelphia.

A FEW business men in the vicinity of Pascoag, R. I., have set on foot the formation of a telegraphic line to connect Pascoag and Providence, and the poles are being prepared. The length of the line will be twenty-two miles.

Dangerous Illness of a Popular Operator.

Mr. CHARLES H. MIXER, of the Western Union office, at No. 145 Broadway, this city, is lying so ill that his recovery is almost despaired of, at his sister's residence in Washington. He was attacked several weeks since with muscular rheumatism and for upwards of a week was sick in bed at the Park Hotel. During this time he was attended by Dr. J. C. Graham, also of 145 Broadway, and so rapidly mended that ere long he was able to sit up and go down stairs. Encouraged by his improvement he made his preparations and left for Washington to visit his sister, with the intention of remaining a week or ten days. On the journey he took cold, and was compelled to take to his bed on arriving there. Continuing to grow worse day by day, his condition on Monday of last week was so critical that his physician deemed a consultation proper,

and during Monday night he was thought to be dying. Since then he has rallied a little, but there is little hope of his recovery entertained by those who know how little fitted he is physically to battle with disease. He is a western man, coming originally from Illinois, and has worked in Chicago, Washington, New York, New Orleans, and the South, generally, as well as in Texas and on the Pacific coast. He is, therefore, well known, and is esteemed on all sides for his genial though retiring traits of character and his abundant ability as an operator. The announcement of his illness and its possible fatal termination will carry sadness in every direction, for his friends abound everywhere.

He Too Was Weak.

SOMEBODY says that consistency is a jewel, and I don't doubt it. When one of the present New York force was working out west, he served under M. C., a very eccentric and dignified chief operator, who used to go out and hoist in the "pizen" with the boys when all hands had got "30." He was a particular friend of the chap at my elbow, and it was pretty hard work a good many mornings for either of them to tell which was M., and which was "t'other un." But, however serious the debauch, the Chief was invariably at his post at night fall, and apparently as sober as a deacon, while his friend quite frequently found himself unfit for service. One night the latter awoke with a fearful headache, and thinking it useless to attempt to go to work, he scrawled a note saying he was ill, and sent it to the office. He had barely put himself outside of a glass of Seltzer, when he received the following reply, which rather startled him by its Johnsonian style and apparent earnestness:

"Office—Telegraph Company,
April 24th, 187—

SIR:

You are drunk. This folly has been repeated to the detriment of the service much too often, and a recurrence of the offence must result in your peremptory discharge. I cannot and will not tolerate it any longer.

Yours, M. C.

P. S.—Where will you be at nine o'clock? I am on it. M."

It seems scarcely necessary to say that the postscript was about the sweetest morsel that ever followed an official signature; nor need I add that at nine o'clock precisely there was a telegraphic reunion on a small scale at the Occidental.

JOHN OAKUM, in *The Switch*.

Bound Copies of Volume IX for Sale.

We have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

MAX.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
14	69% ... 70%	...	...
15	70% ... 71%	...	49 ... 49
16	70% ... 71%	...	50 ... 50
18	69 ... 70%	...	...
19	69% ... 71	...	50 ... 50
20	70% ... 71%	15½ ... 15½	... 50

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended April 14, 1874, and bearing that date.

149,707—MAGNETO-ELECTRIC APPARATUS.—Ernst W. Siemens, Berlin, Germany. Application filed January 20, 1874.

One pole of permanent magnet bent, extended and provided with an aperture into which the other pole takes, the coil being placed in the space left between the two poles.

1. A permanent magnet having one of its poles extended and surrounding the other pole, an intervening space being left between the poles, substantially as set forth.

2. In combination with a permanent magnet, having one of its poles extended and surrounding the other, a coil inclosed or partially inclosed in the space intervening between the poles, substantially as set forth.

3. In the apparatus for the purpose above referred to, described in reference to Figs. 1, 2 and 3, the electric coil C suspended

within the annular space between the magnetic poles or polar extensions S and N' by conducting wires A extending from the rocking shaft B, and rendered adjustable by the spring lever D and screw D'.

4. The electric coil C, suspended within the annular space between the magnetic poles or polar extensions of a magnet, and provided with the hoop C', or equivalent, for utilizing the coil for the purpose of establishing local circuits.

For the week ended April 21, 1874, and bearing that date.

149,907—ELECTRIC STEAM BOILER ALARM.—William C. Baker, New York, N. Y. Application filed March 21, 1874.

Tube, expansible by heat, placed in case connected to boiler. If water falls so tube is exposed to steam increase of temperature causes it to close circuit to an alarm. Another circuit to same alarm is controlled by a pressure diaphragm. Testing circuit from point where alarm is situated is connected to whole apparatus.

1. The pressure diaphragm and the low water expansion tube, constructed and arranged substantially as specified, in combination with the circuit closer f and v, battery g, and magnetic alarms h k, substantially as set forth.

2. The circuit closing button or key r, electro-magnet s, levers t u, and connections, in combination with the magnetic alarm k, low water and pressure indicators, and connections from a galvanic battery, substantially as and for the purposes set forth.

3. The expansion low water indicator, in combination with a circuit closer, electro-magnetic alarm, and battery, substantially as set forth.

4. The pressure diaphragm m, located at or near the boiler, in combination with the insulated adjustable circuit closer 6 and electro-magnetic alarm, substantially as set forth.

5. An electro-magnetic alarm located at a distance from the boiler, and connected in a metallic circuit from a battery with a circuit closing low water expansion indicator at the boiler, and a circuit closing pressure indicating diaphragm, substantially as specified.

150,030—ELECTRIC RAILWAY SIGNAL APPARATUS.—Thomas S. Hall, West Meriden, Conn. Application filed December 31, 1873.

1. The arrangement of a locking lever, f, acting directly on the signal lever g, substantially in the manner shown and described.

2. The arrangement of a yielding rod, m, made in sections m3 m5, which are acted on by a spring, m4, said rod forming the connection between the armature levers n and the signal lever g, substantially as and for the purpose set forth.

3. The diamond shaped cam r1, in combination with the slide r2, switch rails R, lever r3, keys r12 r13, and signals D S, substantially in the manner shown and described.

4. The diamond shaped cam r1, in combination with the danger signal V of a draw bridge, and with a lever r9, keys r12 r13, and signals D S, substantially in the manner set forth.

150,090—ELECTRIC AND THERMOSTATIC FIRE ALARM.—George S. Shute, Boston, Mass. Application filed January 3, 1874.

Two series of thermostats, each acting, through rack and pinion, on wheels having projections b c, which, coming in contact, close circuit. Thermostats act differentially, causing this contact. Two thermostats in each series act, when quiescent, as springs against each other, steadying the apparatus.

1. The combination of the thermal bar A, the cross head C, and the thermal bar A', all arranged to operate together substantially as described, and for the purpose set forth.

2. The combination of the thermostat A A', the circuit closer b b' c c', and the thermostat L L', one series in the thermostats being placed in an inclosed and the other in an exposed space, all operating together substantially as described, and for the purpose set forth.

150,150—ELECTRIC RAILWAY SIGNAL.—John M. Goodwin, Cleveland, Ohio. Application filed July 14, 1873.

The line wire of a railroad telegraph is carried along a bridge or beam supported above the track, and upon this beam is arranged a key for breaking the circuit. Upon the top of a car is a rock shaft arranged lengthwise the car, and having attached to it a series of fingers, which, when projecting upward, strike the key as the car passes under the beam. The fingers may be adjusted to break the circuit as desired for signaling, or, by means of the rock shaft may be turned so as not to strike the key.

1. The signal keys or circuit breakers and the key guards, or their respective equivalents, constructed and operating substantially as and for the purposes described.

2. The rocker shaft or finger rod, and the adjustable fingers or lathes, or their respective equivalents, attached to or carried by an engine, car, caboose, or other vehicle of any kind, constructed and operating substantially as and for the purposes set forth.

Born.

MAYNARD.—To H. C. MAYNARD, Night Manager of the Western Union, Chicago, Ill., office, April 17, a son.

SHOLES.—To C. G. SHOLES, Assistant Manager of the Western Union, Chicago, Ill., office, April 24, a daughter.

Married.

MUNSON—WOOD.—May 13th, at the residence of the bride's father, by the Rev. Mr. Philp, Mr. A. BRUCE MUNSON, Train Dispatcher G. W. Railroad, Palmerston, to MARY E., only daughter of Mr. Thos. Wood, merchant of Paris, Ontario, Canada.

Died.

LONG.—May 1st, MINNIE, infant daughter of W. C. Long, Operator Western Union, Chicago, Ill., office, aged three days.

"Rosebuds just opening are often ruthlessly plucked."

SCULLY.—At Brooklyn, L. I., Thursday, April 30, 1874, after a lingering illness, Bertha M., daughter of Thomas P. Scully, of the Gold and Stock Telegraph Company, New York.

Obituary.

JAMES B. ST. JOHN.

JAMES B. ST. JOHN, who was an employe of the Michigan Central Railroad, J. L. & L. and G. R. V. Railroads, as a telegraph operator at Jackson, Michigan, died of typhoid fever March 21st, 1874, in that city, in the twenty-second year of his age.

He was better liked, more obliging and kindly in his disposition than any one else on the line. His funeral, at the residence of his parents in Grass Lake, Michigan, was well attended by his brother operators. His pure soul was well fitted for the bourne to which he was called. May we endeavor so to live that we may be prepared to join him in that better land.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to—	By Automatic.	New York to—	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.
Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

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364 Broadway,	108 Front St.	143 West St.
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This instrument is in some respects similar to the "SNAPPER SOUNDER," but differs from that device very materially in the matter of form, finish and consequent DURABILITY. The base is composed of the best metal, highly polished, the Spring being Nickel Plated, and capable of producing a clear and pleasant sound. Sent to any address, post paid, on receipt of 40 cents.

The "SNAPPER SOUNDER" will be sent for 25 cents.

“ “ “ with hard rubber knobs, 75 cts.

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THE "SNAPPER" SOUNDER.



NEW STYLES, NEW PRICES.

The unexpected and growing demand for the original "Snapper" Sounder, beyond the expectations of the manufacturers, has delayed the introduction of proposed styles and improvements.

Having increased our facilities and accumulated sufficient stock to enable us to fill orders promptly, the following varieties are now offered for sale at prices which will accommodate all classes.

The "Snapper" Sounder, plain,.....	30c.	6 for \$1.50.
“ “ “ polished,.....	35c.	6 for 1.80.
“ “ “ nickel plated spring...	0.40.	

A few were manufactured to order with hard rubber knobs. They were so well liked that I have decided to introduce them to the fraternity. The springs are secured by two screws, and, should they break, may be replaced at an expense of 15 cents. They are thoroughly made and finished.

PRICE,  75 CENTS.

To the Dominion 5 cents each extra.

☞ A liberal discount to agents.

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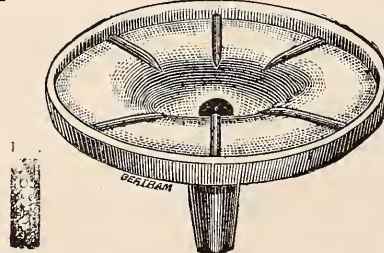
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PATENT BATTERY INSULATOR.



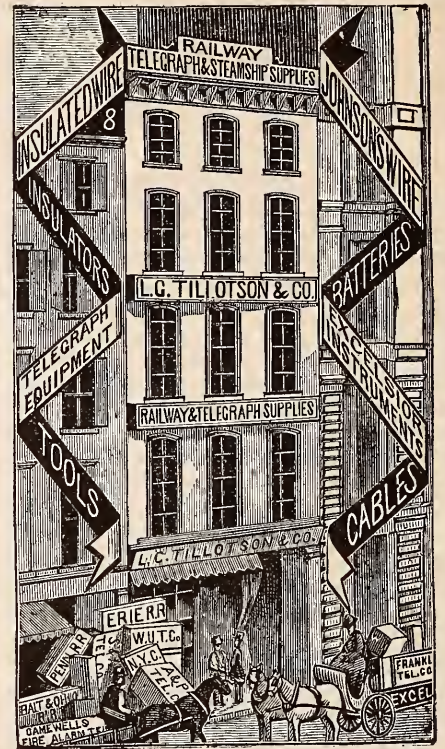
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Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

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EVERYTHING TO BE AS REPRESENTED.

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THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"
"History of America," "Civil War in America;" Member
of many Scientific and Learned Societies of Europe
and America; Commander of the Order of Dan-
nebrog, Denmark; Order of St. Olaf,
Norway, and of the Sword Order,
Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800
pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his
own expense, and he hopes telegraphists throughout the world
will accord to it a patronage commensurate with its merits. For
nearly thirty years the author has been connected with the
telegraphic systems of both hemispheres and an observer for
general instruction, and this work will contain the substance of
facts thus collected, having especial reference to practical tele-
graphy.

The first four volumes will be ready for printing in May, and
the whole work may be issued in monthly parts of quarter or
half volumes.

Vol. I will contain a general history of electrical discovery
by ancient and modern philosophers—the experiments of Otto
Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek,
Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and
others who practically manipulated static electricity; the whole
prepared especially for the telegraphists as useful information
in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic bat-
tery, and the many improvements and modifications of this
telegraphic generator of electricity, considering the experiments
of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and
Grove. Also, magneto and thermo electricities, and the applica-
tion of their respective forces for telegraphic and useful pur-
poses.

Vol. III.—In this volume will be considered Terrestrial Mag-
netism, Aurora Borealis, Magnetic Needle, Ships' Compass, and
Magnetic Phenomena generally. Also, Electro-Magnetism as dis-
covered by Ersted and manipulated by Schweigger, Ampère,
Arago, Sturgeon, Henry, Faraday, Jacoby and others. The applica-
tion of these discoveries for practical telegraphy by inventors,
from time to time.

Vol. IV.—A general history of the ancient and modern tele-
graphic systems, semaphoric and electrical, including telegraphs
of Ohappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil,
Morse, Bain, House, Hughes and others. Also, the construction
of overland, subterranean and submarine lines, including con-
ductors, insulators, paratonnerres, and telegraphic implements
generally.

Vol. V.—This volume will give a full account of the various
telegraphic apparatuses for simple and automatic manipulation;
the combination of circuits for repeating or translating; double
and duplex transmission. It will also contain a large amount of
general information for practical telegraphists, respecting con-
ducting and non-conducting compositions, tables, and a Dictionary
of telegraphic technical terms.

The whole work will be written for the telegraphist, but it
will not be mathematical. The illustrations are designed for
specific instruction, and their explanation concise. It will be
so arranged that either one of the volumes may be bought by
those not wanting the whole.

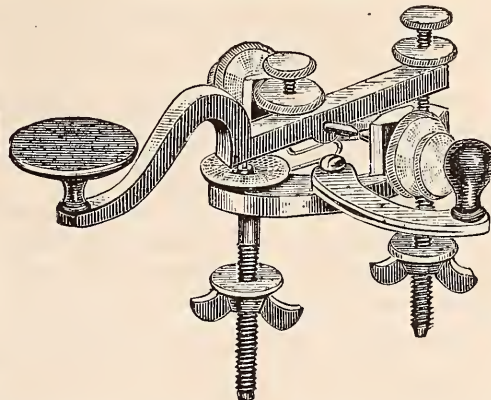
Each volume will have a complete Table of Contents and an
Index.

The above must be regarded as an approximate division of the
subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.

Will not jar open.

Slight pressure of the finger required to put lever in circuit
or cut out.

Acknowledged to be a decided improvement.

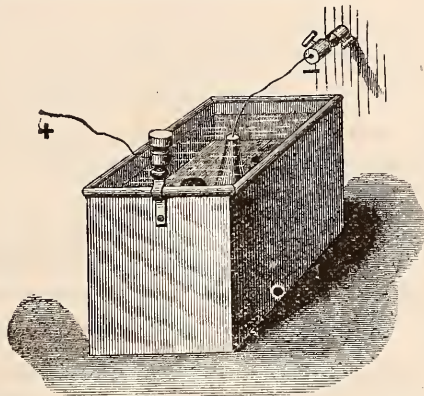
Price, same as the ordinary key.

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"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
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tion for Superintendents and others interested in the Science of
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The Battery cell is made of lead, and forms one pole of the
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These Batteries have been fully tested during the last year,
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bility. When once set up they require no attention for from
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WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

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UNIFORM RELIABILITY.

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Detroit, Mich.,
Dayton, Ohio,
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San Francisco, Cal.,
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Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.,

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

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Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in **Fire Alarm and Police Telegraphy**, upon application as above.

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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAYS

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

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We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

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of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single DANIELL cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made

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Resistance Coils, Submarine Cables,
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This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

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Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

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The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

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FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$250, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

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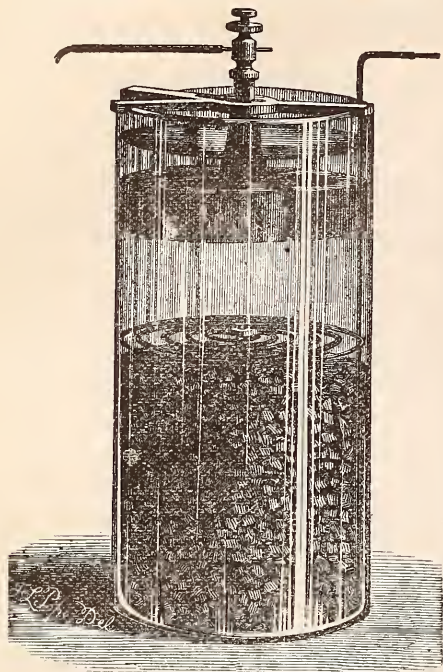
WHICH ARE OF

Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

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THE
LOCKWOOD BATTERY,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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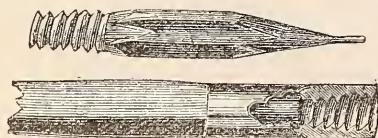
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This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

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Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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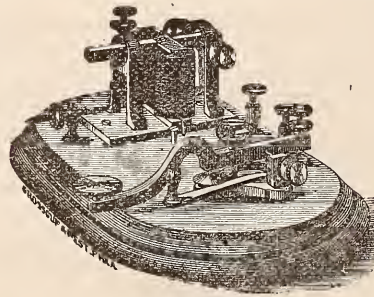
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Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

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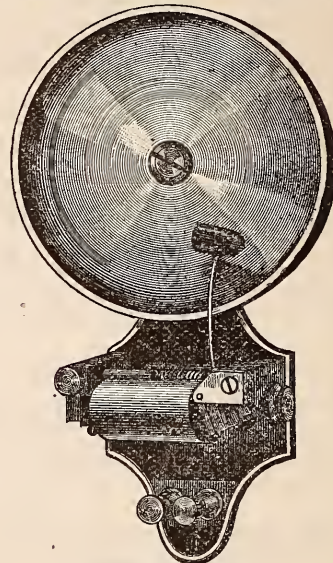
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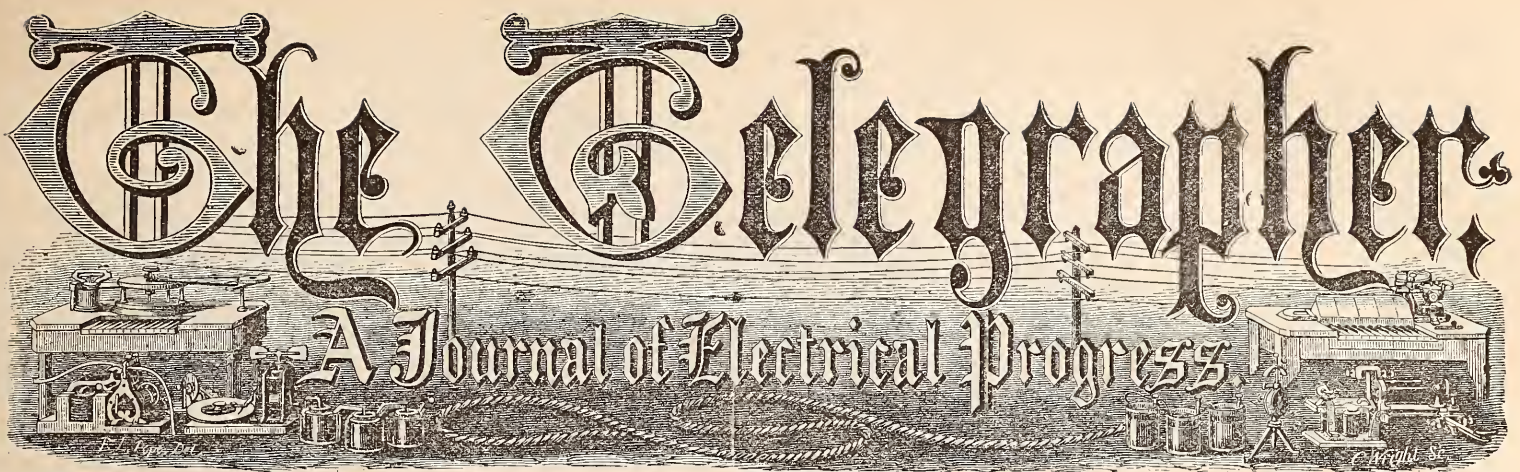
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The Telegrapher

A Journal of Electrical Progress



Vol. X.

New York, Saturday, May 30, 1874.

Whole No. 411

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FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
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EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
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Having recently enlarged our factory, we are now prepared
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BRAIDED LINEN or COTTON COVERED WIRE,
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manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires
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which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Com-
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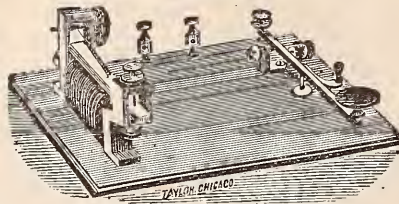
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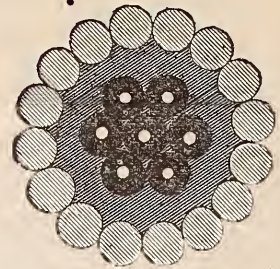
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, MAY 30, 1874.

VOL. X. WHOLE No. 411.

Original Articles.

The Elementary Principles of Electrical Measurement.

BY F. L. POPE.

(Continued from page 97.)

Methods of Measurement.

THE apparatus required for making electrical measurements consists:—First, of a standard or known resistance for the purpose of comparison; second, of a galvanometer, by means of which the existence or strength of the electric current is indicated; and third, of a suitable voltaic battery or other generator of electricity.

All the different methods of measurement employed by electricians may be conveniently divided into four classes, viz:

- 1. The method of equal deflections or substitution.
2. The method of unequal deflections or proportion.
3. The electrical balance or bridge method.
4. The differential method, by the use of the differential galvanometer.

The second or proportional method requires the use of a galvanometer, the deflections of which have a known value, such as the sine or tangent instruments before described. In the first, third and fourth methods, however, this is not essential.

Measurement of Resistance.

In practical work the electrician finds that by far the greatest proportion of the measurements he is called upon to make are those of resistance.

The electro-motive force of each of the different kinds of batteries in ordinary use is sufficiently definite and well ascertained for all practical purposes, and to know what result we can produce by means of them, it is only necessary to determine the resistance to be overcome in doing the work.

The Rheostat.

The measurement of an unknown resistance consists simply in comparing it, as accurately as may be, with some recognized and determined standard, such as the Ohm or the Siemens unit.

* According to Mr. Farmer's determinations the value of the electro-motive force of various batteries in use is as follows:
Carbon, with bichromate solution, 1.75 volts.
Grove, " nitric acid, 1.63 "
Carbon, " (Bunsen), 1.59 "
Daniell (also Calland and Hill), 0.93 "
Smees (in good order), 0.62 "
Leclanche, Manganese, (Jenkin), 1.48 "

having resistances corresponding to multiples and sub-multiples of the standard unit, are arranged compactly in a box, so that by combination any required resistance from 1 to 10,000 units or more may be obtained at pleasure.

A series of brass terminals, A B C, etc. (Figure 16), are arranged upon an insulating slab of hard rubber, R, and each of these terminals is connected to the adjacent one by means of a resistance coil, as shown at 1, 2, 3. These terminals are so arranged that a metallic plug, P, with an insulating handle, may be inserted between any two of them, as shown in Figure 16, and when this is done the resistance coil between these two terminals is short circuited or cut out, as is the case with the coil 1 in Figure 16, the current passing directly from

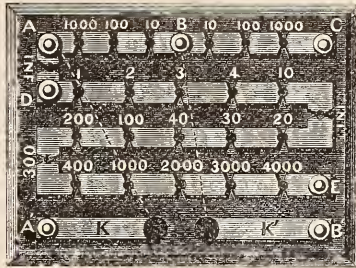


Fig. 15.

one terminal to the other through the body of the plug P, the resistance of which is infinitely small. The most common numerical arrangement of the coils is as follows:

- 1, 2, 2, 5, 10, 10, 20, 50, 100, 100, 200, 500, 1000, 1000, 2000, 5000.

A more convenient arrangement is the following:

- 1, 2, 3, 4, 10, 20, 30, 40, 100, 200, 300, 400, 1000, 2000, 3000, 4000.

With this arrangement the numbers required to make up any particular resistance that is needed may be seen almost at a glance. There are also various ways of arranging the resistance coils and their connections in the box.

Perhaps the most useful arrangement for general purposes is that shown in Figure 15. Binding screws for the attachment of wires are provided at A B C D (Figure 15), and two "infinity plugs," marked INF., which simply serve when taken out to open a circuit altogether. Two keys, K and K', are connected to the coils as shown by dotted lines. The use of these different connections and of the extra coils in the upper row will be explained hereafter.

The wire of which the resistance coils is formed is usually German silver, for the reason that the resistance of this alloy changes less than almost any other

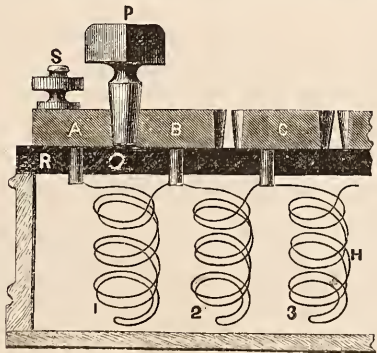


Fig. 16.

with the variations of temperature. The wire is usually insulated by a double wrapping of silk, put on in opposite directions, and the coils are wound double upon bobbins of hard rubber or boxwood, in the manner shown in figure 16, the object of this being not only to neutralize the effect of the induction of the current upon itself within the coils, but also to prevent it from influencing the deflections of galvanometers which may happen to be in its neighborhood.

After having been wound, the bobbins and coils are saturated with melted paraffin, which prevents any moisture from penetrating to the silk covering of the wire, which would tend to partially short circuit the coils, and thus decrease their apparent resistance.

In using a set of resistance coils it is necessary to observe one or two precautions. The brass portion of the plugs should be kept clean and bright by means of

a piece of ehamois skin, and never touched with the fingers, if it can be avoided. Before commencing operations every plug should be in its place, and the operator should try each one with a twisting motion, to make sure that none of them are loose in the holes. Wherever a plug is inserted the same twisting motion should be given it instead of simply pushing it into the hole, in order to insure a thoroughly good connection. When the plugs are all in their places the total resistance of the whole rheostat between D and E, Figure 15, should be a very small fraction of 1 ohm.

Another precaution should never be forgotten in using a rheostat, which is, not to injure it by allowing powerful currents to pass through it from a large battery, when no other sufficient resistance is in circuit. A set of coils may easily receive irreparable injury in this way.

(To be continued.)

The Telegraph Offices in the Corridors of the Capitol at Washington.

ON the 23d of March last a resolution was introduced in the House of Representatives at Washington in relation to the telegraph offices in the Capitol. It was asserted that there was no secrecy possible under the present arrangements, as any sound operator could, if desirous of doing so, become cognizant of the contents of messages sent and received, and the cause of the introduction of the resolution was understood to be that a certain Congressman had, through his private secretary, a telegraph operator, in a fierce contest over an important appointment made by the President, derived an advantage from becoming aware of the contents of messages passing to and fro over the capitol wires, to parties who were opposing him in the matter, even before they reached the parties themselves.

On the 9th inst. a letter from the Architect of the Capitol, in answer to the resolution, was presented in the House, and referred to the Committee on Public Buildings and Grounds, and ordered to be printed.

The following is the correspondence:

"ARCHITECT'S OFFICE, UNITED STATES CAPITOL, WASHINGTON, D. C., May 9, 1874.

SIR: To carry into effect the resolution of the House of Representatives, passed March 23, 1874, directing the Architect of the Capitol to cause the telegraph instruments located in the corridors of the south wing of the capitol to be so isolated that it shall be impossible for any unauthorized person to hear and obtain messages, etc., I have caused the wires to be examined.

It is found that in some cases these wires connect with instruments in hotels in this city, and that all the wires connect with various cities and stations between this and the northern cities.

In consequence of the above facts, I wrote to the officers of the various lines having stands in the capitol, suggesting certain changes, and have received replies thereto from the Western Union and the Franklin Companies, which are herewith submitted.

Mr. J. F. Knapp, operator of the Government telegraph for the south wing, was sent along the lines as far as the city of Boston to make the necessary examination. His report is also herewith submitted.

As from the facts disclosed by Mr. Knapp's report it is evident that the intended isolation of these stands will not prevent the possibility of unauthorized persons obtaining messages, I respectfully recommend that the resolution of March 23 be so modified as to require the telegraph companies to erect suitable screens and to muffle the instruments in the manner recommended by Superintendent Smith, of the Franklin Company.

I also suggest the propriety of passing a law fixing a penalty or punishment on any person who may divulge any message sent by telegraph, or intercept or take off any messages from the wires.

I am very respectfully, etc., EDWARD CLARK, Architect United States Capitol.

HON. JAMES G. BLAINE, Speaker of the House of Representatives.

THE WESTERN UNION TELEGRAPH COMPANY, MANAGER'S OFFICE, CORNER PA. AVE. AND 14TH ST., WASHINGTON, D. C., April 7, 1874.

DEAR SIR: I have your favor of the 6th instant relative to isolation of the telegraph instruments at the Capitol. All the wires of this company already run direct from the Capitol to our main office without passing through any other branch offices. I note your suggestion that the sound of the instruments be muffled, but I do not think it would accomplish the object. A more satisfactory arrangement, I think, is to dispense entirely with the sounder, which has been done in our public office, leaving the operator only his relay to read from, which reduces the sound to the minimum neces-

sary for his own ear. I think you will agree with me that this will effectually secure the obje ct.

Very respectfully,

LEONARD WHITNEY, Manager.

EDWARD CLARK, Esq., Architect, United States Capitol.

EXECUTIVE OFFICE OF THE ATLANTIC AND PACIFIC AND FRANKLIN TELEGRAPH COMPANIES, No. 198 BROADWAY, NEW YORK, April 28, 1874.

DEAR SIR: On receipt of your letter regarding the resolution of the House regarding the telegraph offices in the corridor of the House, I inclose the same to our Manager at Washington, Mr. Kennedy Duff, with a letter of instructions directing him to call upon you in reference to the matter, and to take any steps that may be necessary to meet your views in this matter. My own idea of the best way to accomplish what seems to be required would be to inclose the office with suitable surroundings corresponding nearly to that of the present office of the Western Union Company; then to place in the office a silent instrument, comparatively; that is, an instrument requiring an ear trumpet leading from the instrument to the operator's ear, similar to a description of instrument used at one time by competing companies when the Western Union controlled the Morse patents. Mr. Knapp is familiar with them, and can describe them fully to you. Also to place around the hand of the operator a screen, so that the motion of his hand when transmitting cannot be observed by persons looking into the office. This would seem to me preferable to any attempt to place the operator in a secluded room, as he might in such case allow people inside his office unobserved; whereas, situated in the corridor, the office is so public that an operator will not dare to do such a thing, as it would be too readily observed.

Any plan that is finally adopted will be cheerfully acquiesced in by us.

Very truly yours,

JAS. G. SMITH, Superintendent

HON. EDWARD CLARK, Architect, United States Capitol.

WASHINGTON, D. C., May 7, 1874.

SIR: As directed by you, I have examined the wires running from the different telegraph offices in the corridor of the south wing of the Capitol, and (as near as I can ascertain) find that the Franklin Company's wires connect with the instruments at Willard's Hotel, and the Western Union Company's wires, from their office in the corridor (from which office they transmit all commercial despatches), connect with the instruments in the reporter's gallery of both the House and Senate wings of the Capitol, from which instruments messages could be taken by unauthorized persons.

I have also examined the wires of the different telegraph companies between this city and Boston, and find that the Automatic Telegraph Company's wires only run as far as New York City, but connect with several way stations between here and that city (New York). The through wires of the Western Union and Franklin Companies, which run through to Boston, connect with various way stations, which stations are not allowed to use said through wires except for test purposes, but despatches could be abstracted from the through wires at these way stations by experts.

From my observations and my practical knowledge of telegraphy, I am confident that the removal of the offices in the corridors of the capitol to more private places will not render it impossible for unauthorized persons to obtain despatches from the wires.

In conclusion, I will state that I believe if 'silent instruments'—that is, an instrument requiring an ear trumpet, leading from the instrument to the operator's ear, as proposed by Superintendent Smith, of the Franklin Telegraph Company—were placed in all the offices in the corridors of the Capitol, and screens placed around the stands similar to that of the Western Union Company's, there would be no more danger of the abstraction of a despatch from these stands in their present location than there would be if each were placed in a separate room.

Very respectfully yours,

J. F. KNAPP.

HON. EDWARD CLARK, Architect, United States Capitol.

Pluck.

A PRETTY fair illustration of the amount of pluck contained in the average Yankee is embodied in the appended message, which was sent in reply to one offering assistance. The gentleman who sends the following was a loser by the Williamsburg reservoir calamity to the extent of upwards of half a million of dollars: "Much obliged; nothing wanted at present. Commence on new works to-morrow morning. Not the least discouraged."

The Telegraphers' Mutual Benefit Association.

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- 13, 15, 17, 23, 26, 28, 37, 58, 60, 65, 67, 70, 72, 75, 80, 89, 97, 99, 101, 103, 108, 114, 120, 129, 140, 146, 171, 179, 183, 189, 190, 191, 193, 197, 198, 215, 218, 227, 240, 248, 267, 274, 278, 279, 281, 282, 283, 285, 286, 301, 342, 353, 367, 372, 378, 380, 391, 392, 393, 402, 405, 413, 438, 456, 476, 481, 484, 510, 511, 512, 520, 527, 533, 542, 553, 554, 569, 573, 574, 575, 586, 587, 659, 656, 662, 663, 664, 665, 669, 672, 678, 680, 685, 708, 714, 725, 730, 733, 734, 737, 764, 772, 808, 813, 820, 848, 858, 869, 870, 875, 876, 883, 899, 901, 905, 908, 911, 912, 922, 927, 938, 939, 942, 952, 976, 977, 991, 992, 1001, 1005, 1011, 1028, 1058, 1069, 1074, 1075, 1076, 1098, 1100, 1101, 1102, 1103, 1127, 1149, 1164, 1199, 1205, 1208, 1217, 1227, 1233, 1237, 1238, 1240, 1241, 1248, 1270, 1277, 1282, 1288, 1294, 1307, 1308, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1318, 1319, 1320, 1321, 1322, 1345, 1253, 1344, 1355, 1356, 1358, 1372, 1375, 1376, 1385, 1389, 1390, 1391, 1398, 1407, 1417, 1418, 1425, 1428, 1437, 1438, 1448, 1451, 1453, 1454, 1455, 1456, 1482, 1483, 1498, 1500, 1501, 1505, 1506, 1507, 1508, 1515, 1516, 1524, 1531, 1546, 1554, 1559, 1562, 1563, 1564, 1572, 1580, 1589, 1610, 1611, 1612, 1623, 1625, 1626, 1630, 1631, 1632, 1646, 1650, 1652, 1656, 1660, 1661, 1662, 1663, 1665, 1676, 1681, 1682, 1714, 1732, 1733, 1773, 1775, 1794, 1795, 1796, 1797, 1802, 1804, 1815, 1818, 1823, 1824, 1844, 1845, 1854, 1863, 1681, 1900, 1901, 1906, 1916, 1917, 1921, 1942, 1957, 1970, 1972, 1991, 1995, 1999, 2000, 2001, 2004, 2016, 2021, 2027, 2048, 2060, 2061, 2065, 2072, 2079, 2083, 2084, 2095, 2098, 2103, 2112, 2114, 2116, 2119, 2120, 2123, 2125, 2137, 2131, 2136, 2137, 2142, 2143, 2154, 2159, 2166, 2167, 2169, 2179, 2180, 2189, 2193, 2202, 2203, 2304, 2205, 2206, 2207, 2208, 2209, 2110, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 62, UP TO AND INCLUDING MAY 25, 1874.

- 15, 16, 17, 21, 23, 28, 37, 46, 52, 54 58, 61, 64, 65, 74, 75, 77, 86, 88, 103, 113, 120, 122, 129, 131, 145, 148, 157, 179, 208, 215, 217, 228, 248, 267, 269, 274, 277, 278, 279, 281, 282, 283, 285, 286, 289, 301, 342, 349, 351, 352, 360, 372, 378, 383, 385, 391, 394, 405, 413, 416, 426, 464, 467, 478, 509, 510, 520, 526, 532, 533, 536, 542, 546, 547, 549, 553, 564, 576, 579, 587, 615, 618, 626, 649, 656, 672, 678, 680, 685, 708, 721, 731, 734, 737, 740, 764, 769, 791, 813, 821, 825, 832, 856, 875, 912, 915, 917, 941, 976, 977, 991, 992, 1001, 1005, 1011, 1013, 1028, 1039, 1081, 1088, 1090, 1098, 1126, 1127, 1147, 1148, 1167, 1173, 1183, 1195, 1199, 1202, 1208, 1210, 1232, 1260, 1266, 1267, 1274, 1276, 1300, 1306, 1357, 1358, 1368, 1394, 1402, 1403, 1404, 1407, 1410, 1425, 1444, 1451, 1453 1454, 1455, 1456, 1482, 1484, 1489, 1506, 1507, 1511, 1516, 1524, 1527, 1537, 1550, 1554, 1562, 1564, 1571, 1579, 1589, 1590, 1615, 1623, 1625, 1630, 1632, 1634, 1678, 1708, 1729, 1735, 1736, 1818, 1862, 1894, 1900, 1901, 1919, 1944, 1950, 1973, 1999, 2000, 2001, 2019, 2028, 2030, 2048, 2049, 2082, 2083, 2101, 2103, 2116, 2129, 2133, 2135, 2137, 2154, 2168, 2169, 2172, 2174, 2187, 2190, 2199, 2201, 2204, 2211, 2212, 2213, 2218, 2219, 2220, 2221, 2222, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250.

MISCELLANEOUS.

- 58—1409, 2029. 59—2029.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

American District Telegraph Company.

NEW YORK, May 23.

TO THE EDITOR OF THE TELEGRAPHER.

IN your issue of this date you state that the Compulsory Education Law, recently passed by the Legislature, "is likely to cause great inconvenience to the telegraph companies, and especially the American District Telegraph Company, which employs at the present time, in this city and Brooklyn, upwards of 400 messen-

gers, of whom, probably, nine tenths are within the age affected by the law," viz., eight to fourteen. We employ in New York 365 messengers, of whom there are not more than five under fourteen years of age. Our rule is to take none under fourteen, or over sixteen years of age.

Our messengers, in the performance of their duties, are brought in contact with the leading business men of the city, and it has been one of the valuable fruits of our system that we have found remunerative employment not only for hundreds of boys who otherwise would have been idle, but more than a hundred have, within the past two years, found permanent places at an advance upon the wages we pay, with subscribers whom they have pleased.

E. B. GRANT, Vice-President.

"Out West."

May 15.

TO THE EDITOR OF THE TELEGRAPHER.

AFTER three years' "sage brush" I again set my foot on my native heath, or at least what is more like it than the howling wilderness. In the lonely hours of solitude THE TELEGRAPHER was my solace. I watched for its arrival as a lover would for a letter from his sweetheart. Through it I learned how the "boys" were getting on and where they were, and often thought to myself, "Well, I wonder if Jack is as good a hand at draw poker as he used to be, in that little lager beer saloon on West Broadway." Or, "Oh, there's Jim promoted! Well, it's time—long study and patience is at last rewarded." It would have been before, but Jim was no sneak. He had a manly way about him, and your superintendents now-a-days don't appreciate manly ways. A sweet smile and a cunning, insinuating manner is sure to get ahead of honest ability. Pretend you know everything, and you are sure to be promoted; be modest, and your modesty will keep you in the same place. Hammering brass on the wires, instead of hammering it into your face, is an ambitionless career, and a thankless one.

I see now and then, through THE TELEGRAPHER, that some good appointments are made, and I also notice some very bad ones. I see plenty to criticize—if to criticize would do good. I see some honest, able fellows come to the front and speak their minds, and offer some capital suggestions, but what good does it do? Have any of those suggestions been acted upon? Operators look upon each other with suspicion—a severe lesson having been taught them, that the greatest brawlers and the most sanguine strikers were the first to back out and supplicate to the Western Union managers for reinstatement. I heard it said that an operator on the Pacific coast boasts he cost the Western Union more trouble and money than any other living man. I heard his name, also, but I do not give it, because, were I in his place I should be ashamed to make such a boast; for, for every dollar and annoyance he caused that company he lowered, through his impetuous and bad judgment, the standard of compensation, and carried misery and mistrust into many a man's house and heart. But enough of this.

I am out of the sage brush and am travelling around for a few weeks. In a few days more I shall be at my post again, but I cannot go back without fulfilling a duty I owe to the fraternity, which is, to give them the benefit of my observations. To commence with Omaha. Did it ever strike any operator as strange that a first class, steady operator, could not be found to stay in that town over six months? "'Tis true, 'tis pity—pity it is 'tis true." I will ask a few questions of any general superintendent; let us take, for instance, the most liberal of them all, and perhaps, the most able, energetic and competent—General Stager—who, although I have not met him since the little family quarrel we had in '61 broke out, I yet believe is not much changed. If General Stager of to-day is as good a man as the Stager of '58, then I will ask him a few questions.

Would he, as a first class man, who thoroughly understood his business, like to be treated other than as a man? Supercilious foppery does not become any manager, and a first class man is not going to submit in this, the nineteenth century, to "The insolence of office and the spurns that patient merit of the unworthy takes."

A man is a man, even if he becomes a telegraph operator, and yet some managers forget this. Again, sir, would you, operator as you were, like to have any suggestions you may have had to offer treated with contempt and derision? Would it not lessen your desire to advance any subject to such a manager, even though the vital interests of the company demanded it?

Would you, as a first class man, like to be abused over the wire by inferior operators, who, as is often the case, to cover their own inferiority, will pour forth a torrent of invective against you and your writing, and if you retaliate (and, mark me, I do not believe in retaliating, but human nature is human nature still) this plug will at once report you, and the manager sees only

one side, and that is generally the side which reports first; you are abused—told if you cannot conduct yourself better you must go elsewhere, etc., etc. *Elsewhere* that operator is sure to go. Show me an office where first class men stay a long time, and do not desire a change, and I will show you a good manager, both for the company and for the men under him. Pettifogging, spiteful, jealous and irritable natures are not those calculated to become great men nor judicious managers. We find this class of managers and chief operators, who know everything, their great hold is to talk, and if they come across a man of greater brain than tongue, they take his silence for ignorance, and pour forth a stream of rhetoric into his already weary ears. Contradicting them is of no use; you can bring forth the printed rules of the company, or Pope, or Culley, and cite from them till you are tired; the manager knows better; he gets jealous at once of such a man, and the first opportunity to blackmail him is a godsend. The country is flooded with this class of fops and sneaks, whose only recommendation is "I never drink, sir." They are seldom first class operators, but they can recount feats done ten years ago that would make "Old Pratt" hold down his head. Do you like the picture? Every superintendent ought to have one.

Now, General, how many bulls have you traced to the Omaha office within the last year? How many of these were made by strange men, unacquainted with that class of business? How many did you trace to Salt Lake? Now, "look here upon this picture and on this;" the men in the latter place have been there several years; manager, chief and operators cannot be beaten on this continent as reliable, capable men, and they all drink. "Many a night and oft" have I lain on my bunk and listened to Salt Lake and Omaha work, and I wished then and now that General Stager was there also; he would have had the opportunity of realizing the fact that a good operator was worth more than \$125 per month, it a plug was worth \$100. The plan for keeping good operators in one place is—change the manager, and not the operators; in nine cases out of ten this will remedy the difficulty of a constant change of subordinates.

Besides, managers are inclined to throw too much on to the shoulders of operators. I know several who have five other occupations. One of the force is called upon to keep the books, and, hence, either repeaters or way lines are neglected, or an extra man is put on.

Another kind of manager who deserves to be shown up is ye sanctimonious manager, and, with the assistance of Providence, he will occupy my thoughts the next time. I have had sad experience with these sanctimonious managers, who, when known, were no other than lying hypocrites and designing speculators, enriching themselves through their position to spy on honest men's business. How long, in God's name, will this last? How long will superintendents be blindfolded, and operators made the lambs for sacrifice, to cover the iniquity of this worthless, conniving trash? Some of them, to say the truth, are able enough to fill these positions, but is the choice judicious? When the people with whom they transact business cannot be induced to place faith in their integrity, and good operators cannot be found to remain with them, then it is time they were either reduced to the ranks or sent to warmer climates. False zeal costs more than honest industry. The former lives always in a glass house, while the latter enjoys with confidence the pure, untainted light of heaven.

We want to adopt a method for self-preservation. We cannot do it other than by giving to THE TELEGRAPHER our support in every respect, and make it the medium of redressing our grievances, if we have any. A good man need never be afraid, yet I know men high in the confidence of the Western Union executive department who would hate to see some episodes of their official career in print. To this end let us all join hands, and if I see that this letter brings out "the boys," and has the effect for which it is intended, then, and not till then, will you hear again the voice of
THE SAGE BRUSH GOPHER.

The Proposed Society of Telegraphic Engineers.

TO THE EDITOR OF THE TELEGRAPHER.

I HEARTILY approve of Mr. Miller's proposition in THE TELEGRAPHER of May 2d, in reference to organizing an American Society of Telegraphic Engineers. The plan of organization would need, however, to be quite different from that of the sister society in England in order to make it successful, as the conditions in this country are, in many respects, very different. We Americans have two obstacles to contend with in keeping up such a society, which do not exist to anything like the same extent in England. In the first place, our members will probably be scattered all the way from Maine to California and from Canada to Cuba, and, therefore, only a small number of them could be got together, personally, at one time, except at infrequent intervals. The second difficulty is, that every electrician in this country, who would naturally belong

to such an association, is already fearfully overworked, and could not afford to spend very much additional time in carrying out its plans. Take the list of names given by Mr. Miller; there is scarcely a man on it, including himself, that doesn't work like a hod carrier for twelve hours a day, and from that up to twenty-four, upon emergencies, to say nothing of Sundays. Our English brothers work but six or eight hours a day, as a rule, and have some time left for studying, experimenting and writing. Therefore, in our plan of organization we must, of necessity, take these facts into consideration.

There are a few suggestions which have occurred to me, upon which I should like to get the views of those interested.

A good name would be, "The American Electrical Society." This would embrace everything in our line, and be brief and convenient.

I think it would work well to have three classes of members, viz., active, honorary and student, making no distinction between resident and foreign members.

The active membership should be limited to persons of considerable standing and ability, either as electricians or practical telegraphic managers. Honorary membership should be conferred, as a title of distinction, upon such proper persons as may be thought advisable from time to time. The students should embrace that very large class of intelligent and ambitious young operators who are endeavoring to fit themselves for the higher branches of the profession, and who, by becoming members, would have a right to the assistance and instruction of their more experienced associates, whenever needed by them.

The officers needed would be a president, perhaps, a vice-president, secretary and treasurer, and a council of three members. It should be made an absolute condition of admission as an active member, that the candidate should furnish an original paper, either of a theoretical or practical character, of sufficient value and interest to be accepted by the council, and afterwards published in the transactions, and each active member should also be required to furnish such a paper at least once a year, in order to retain their membership. Only by using some pressure of this kind can we ever get anything out of them, for they will otherwise postpone the matter for that leisure hour which never comes. In this way, too, a candidate will have to prove his fitness for membership, or he can't get it. Of course he should be balloted for as well.

An annual meeting of a couple of days might be held, alternating in different cities of the country, and the transactions should be printed in a neat and handsome yearly volume, including all papers contributed by the members and accepted by the council.

Such an organization, I think, would be quite inexpensive, would not require much labor or time, and would be of great value and interest, especially if a really good secretary could be secured. Of course, the whole thing may be greatly improved as it grows older, but I think it would not be advisable, under the circumstances, to attempt too much at first. F. L. POPE.

Elizabeth, N. J., May 27, 1874.

An Electric Surprise.—A Confirmed Telegraphic Rascal.

ALBANY, OREGON, May 10.

TO THE EDITOR OF THE TELEGRAPHER.

YE saints protect us! Oregon, that paradise of the United States) is certainly "going back" on us. Last Monday eve, sitting in our office working, our ears were greeted by that once heard, long to be remembered—*Pop!* of the relay and our eyes fairly "banged out" on seeing the table covered with a halo of fire. The alacrity with which we vacated was somewhat astonishing—we were not in a hurry, but concluded to go.

Recovering from our shock, we were amused at one of our boys trying to work, but who only got into a perfect phrensy over "That d—n fool breaking him;" was going to report him "right away, quick." I remarked that he would have to go to headquarters to "report that feller." He believed me the next moment when a lick came that fairly raised our friend off his feet. He merely remarked, "lightning by jove!" Our friend Johnny Williams, at Gervais did not escape so luckily in regard to office and instruments. He had occasion to go into the freight department and cutting out the office, although the plug was nearly two feet from the line, this space was jumped by lightning, which entered the office, setting fire to the building, and literally splitting the register and key to pieces, but leaving relay un-injured. Johnny had fortunately got out of the way, thus saving his brother operators the trouble of holding a "wake" over him. With the help of some citizens the fire was soon subdued, but not until the office was damaged to a considerable extent.

The line from Aurora to Salem was damaged a great deal by the lightning. A great many poles struck, and in some places the wire was melted. Gervais is the only office that suffered to any extent, although in several

of them some of the "boys" got "upset" or severely shocked, and a great many beat a lively retreat.

This is the first severe lightning spree ever known in Oregon, and we sincerely pray that it may be a long time ere we are visited again. We are all unanimous in the opinion that we would a great deal rather manufacture our own lightning; and protest against this cheap and to us almost unknown article thrown upon us in this way!

It seems that A. J. Curtis, alias J. K. Bear, has made another haul! A few days ago, O. P. G. Plummer, District Superintendent, of the W. U. Telegraph Co., received a photograph and description of the former from C. S. Jones, Superintendent of Telegraph Illinois Central R. R. Co., stating that Bear had made another steal at Waverly, Iowa, January 28th.

It will be remembered that this Curtis—Bear, some time in '70 stole some \$12,000 belonging to the Express Co., while he was agent and operator at Brownsville, Neb. He succeeded in escaping, and came to Oregon, and obtained a situation on our line as agent and operator at Oregon City; and by his prompt attention to business, and pleasant manners, made a great many friends. The officers of the law, however, tracked him down, and came in on him one day as he was sending messages. He asserted that he was glad they had caught him, that he would make no attempt to escape, as he had had no peace since he embezzled the money, and intended to stand his trial, and, if convicted, serve his sentence out, and when out, would turn over a "new leaf entirely"—but the sequel proved otherwise.

He was taken East, and after a rigid examination, sentenced to one year's confinement in the Penitentiary, but was pardoned, and set at liberty before his time had expired.

Such persons steal once too often, and we can't help thinking that Curtis will take up quarters in a hotel with bars across the windows—to keep thieves from breaking in on him.

While you in the East are still having cold weather, we are enjoying nice summer weather. Flowers have been in bloom for three months; strawberries, etc., nearly ripe, and all kinds of "garden sass" in the markets for several weeks. "Dost thou like the picture?"

WEBFOOT.

Personals.

Mr. J. M. MOFFATT, the genial "Patsy," has returned from Plaistow Cove, Nova Scotia, after a stay of nearly two years, and is at present visiting his people in Scranton, Pa. He expects to go to Saratoga for the Western Union when the season opens.

Mr. GEORGE W. SAWYER, of No. 145 Broadway, New York, is at home in Lewiston, Me., taking on a fresh supply of health to meet the coming "spell of weather" in Gotham.

Mr. A. H. BABB, late of the Western Union at St. Louis, is stopping in New York now, having arrived recently. He will probably take a position here about the 1st of June.

Mr. RUSSELL RILEY, formerly of Baltimore, Md., but more recently of the Western Union at Philadelphia, has accepted a position with the A. & P. and Franklin Companies, at No. 198 Broadway, vice Mr. WEBSTER gone to Cincinnati.

Dr. FOWLER BRADNACK has accepted a position with the A. and P. and Franklin Companies, at No. 198 Broadway.

Mr. JOSEPH W. WOOD, late of the day force at No. 145 Broadway, has been promoted to fill the vacancy caused by the resignation of Mr. STEPHEN G. SAUNDERS, and which has been temporarily filled by that prince of good fellows and eminently able operator, Mr. L. E. WELLER. The latter named gentleman returns to the day force, to the sincerest regrets of the night force at his departure thence, and warmly welcomed back by his collaborators of the day.

Mr. CHARLES H. MIXER, of whose illness mention was made last week, is considerably improved, and there is now a fair prospect of his recovery.

Mr. S. W. KEELEY, formerly of the Northern Pacific R. R., at Brainerd, Minn., has accepted a position on the telegraph line of the Lake Superior and Mississippi Railroad, at St. Paul, Minn.

Mr. E. O. ELLIOT, of the Division Superintendent's office of the American District Telegraph Company, 516 Broadway, has been appointed manager of the Fifteenth District office of that Company, at 397 Broadway.

Mr. H. DOHERTY has been appointed manager of the First District office, 102 Broad street, of the American District Telegraph Company.

TELEGRAPH operators who "fritte gerse," are apt to look upon THE TELEGRAPHER as not adapted to their comprehension—and they are right.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Bound Copies of Volume IX for Sale.

WE have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

Congress, Inflation and the Telegraph.

BOTH Houses of Congress having adopted a resolution to adjourn on the twenty-second of June, it is not probable that the session will be prolonged beyond that day. There remains, therefore, only three weeks in which to complete the business actually necessary to be done before the adjournment. Both the Senate and House are laboring industriously to get all the necessary business transacted speedily, and the remaining time will give opportunity for the consideration of none but such matters as must be acted upon. The appropriation bills will occupy a good portion of the time, and these are now being progressed rapidly.

The country has escaped, through the wisdom of the President, a great misfortune through the defeat of the measures which, under a mistaken idea of the demands and necessities of the people, at one time seemed likely to be adopted, for an inflation of our irredeemable currency, and a still further postponement of the time when we shall be able to resume our position among the solvent and specie paying nations of the world. There has been a great change in public opinion in some sections of the country on this question since the President interposed his Constitutional prerogative for the protection of the public credit. Many of those, who before were inclined without much reflection to regard an inflation of the currency of the country as the panacea for the ills under which we are suffering, have been led by the wise and statesmanlike character of the message vetoing the currency act to examine the subject more carefully, and have come to the conclusion that their previous views were erroneous. We believe that the danger which threatened us in this respect has now passed, and the prospect is more encouraging for a gradual revival of business and enterprise. This will not probably be very marked until the latter part of the summer; but we entertain the

hope that the fall trade will inaugurate a new and more substantial season of prosperity.

The telegraph interests of the country have suffered with business interests—generally, and little can be expected in the way of extensions and additions to telegraph facilities until these revive. The reduction in the business of the telegraph lines has compelled a reduction of the number of operators and other employes, which has made it difficult for all who have hitherto found telegraphic employment to obtain situations. The effect upon the business of manufacturing and dealing in telegraph apparatus, material and supplies has been even more marked, and this department has not probably been in so depressed a condition for many years as it is at present. Besides the competition is very great, and the business is divided up as it has never been before. We expect to see an improvement in this, as in other branches of telegraph business in a few months, but there cannot be very much looked for in this respect before another season.

The early adjournment of Congress disposes finally of any probability of anything being done affecting materially telegraphic interests. What the *Springfield Republican* facetiously terms the GARDNER HUBBARD and WILLIAM ORTON debating society will stand adjourned until next winter, and as the next session of Congress is the short one, expiring by Constitutional limitation on the fourth of March next, there is little danger of any important action, in any event, until the meeting of the Forty-fourth Congress, a year from next December. The Government Telegraph advocates, as well as the currency inflationists, have come to grief, and in the case of the former, as well as the latter, we believe the great majority of the people will say heartily "So be it."

With the immense national resources of the country, and the generally intelligent and energetic character of the people, there can be but a temporary check and depression in the onward march to prosperity and wealth. Floods may come and conflagrations destroy, speculation and our trading may for a time partially paralyze industry and limit production; extravagance and an undue haste to become rich may injuriously affect the general prosperity, but we shall now, as heretofore, and at no distant day, overcome all these, repair the waste and loss, and with renewed and increased energy and vigor resume our former position as a people, the most prosperous, and possessing in a preëminent degree all the elements of advancement and wealth.

The telegraph, not only as it is but as it shall be, is one of the elements most conducive to national prosperity and advancement, and as such will fully participate in the advantages of the good time coming. That it is destined to still greater development, there can be no question. Let us wait patiently and labor earnestly and faithfully to hasten the time when telegraphs shall become remunerative to the investors in its capital, and to those who, from necessity or choice, live by engaging in its service.

Arrival of President Orton.

By the steamer Oceanic of the White Star Line, which sailed from Liverpool on the 14th and from Queenstown on the 15th inst., and arrived at this port Sunday evening, Mr. ORTON, President of the Western Union Telegraph Company, and wife, returned from their brief European tour.

We are pleased to learn that both Mr. and Mrs. ORTON have been very much benefited by their trip, and return home much improved in health. Mr. ORTON will, we understand, resume the executive management of the Western Union Company at an early day, which, since his departure, has been for the time under the administration of Mr. A. B. CORNELL as acting President.

Mr. ORTON has been cordially greeted by his numerous friends, who are much pleased to see him once more with them, and, with improved health and energy, prepared to again undertake the management of the

great telegraph company, which, under his able administration, has met with so marked advancement and success.

A Liberal Response.

THE firm of L. G. TILLOTSON & Co., respond to the present financial situation by making a reduction on all telegraph instruments, of their own manufacture, of twenty per cent. on their list of prices. This is a very liberal reduction, and is a new evidence of the enterprise and liberality of this firm. The financial depression and the competition in the manufacture and sale of telegraph instruments and apparatus have had their effect, and excellent articles in this line can now be had at much less than former prices. Competition, whatever may be its effect upon those engaged in the business, is beneficial to purchasers, and we have no doubt but that many will avail themselves of the opportunity now afforded to purchase telegraphic apparatus at even less than panic prices. Those who are likely to need such articles within the next year will do well to purchase now of the advertisers in THE TELEGRAPHER.

A Correction.

THE fourth paragraph of the communication published in THE TELEGRAPHER of last week, on "The Proposed Society of Electricians and Telegraph Engineers," over the signature of "HERMES," should read "privileges which a naturally gracious but much abused public would cheerfully grant," instead of "carefully grant" as printed.

An Error Corrected.

By a communication which appears in our correspondence columns from Mr. E. B. GRANT, Vice-President of the American District Telegraph Company, it appears that we were misinformed in regard to the ages of the major part of the messengers employed by that company, and that very few of them come within the ages prescribed in the law enforcing education of all children in this State under fourteen years of age. It appears from Mr. GRANT'S communication that the rule is to take none under fourteen or over sixteen years of age, which, of course, relieves that company from prospective difficulty in the matter.

The Telegraph.

The American District Telegraph.

THE patrol system, established by the American District Telegraph Company in the Fifteenth District, the office of which is at 397 Broadway, by which subscribers' stores are visited regularly every hour, is to be introduced in the Tenth and Nineteenth Districts, also, and patrol boxes are about to be placed in position in the latter districts.

The office of the Thirty-first District, formerly at 907 Broadway, has been removed to 946 Broadway—adjoining Dodd's Express.

The company have commenced canvassing for subscribers with a view to the establishment of the Thirty-sixth District, with headquarters at Sixty-fifth street and Third Avenue.

The Telegraph in Japan.

THE rapid progress which the Japanese are making is very forcibly shown in their telegraphic extensions. Mr. Thomas J. Larkin, who has been in that country for the last three years—having gone out there from England under an engagement with the Japanese Government, is the Superintendent of the Telegraphs. The metropolis, Tokio, is fully connected by telegraph at all the principal points, twelve stations having been opened in that city. The whole system is constructed on Siemens' iron poles. The lines have been extended about two hundred miles to the north, with a railway system in process of construction. The instruments principally used upon the Japanese lines are Siemens' Morse, worked by the polarized relay, Hawley's Morse (which is not a favorite), Breguet's dial instruments, and, for railway purposes, Siemens' needle instruments and blocks. Porcelain insulators are used, and made in the country, as also galvanized iron for the wires.

The work of construction is being pushed north of Yokohama to Hokodadi. The Japanese operators are

becoming quite expert manipulators, and bid fair to prove, in the future, good telegraphers. All of them understand more or less of the English language. The Japanese use the wires extensively, and the institution is likely to repay the government, which owns the lines, very well.

The New Atlantic Cable.

A PRESS despatch from Halifax, N. S., of the 27th inst., states that the steamship Faraday, with the new Atlantic telegraph cable on board, which sailed from England on the 17th inst., was expected off that coast in a few days. The cable is to be landed at Berry Head, Parr Bay, in Guysboro' county, 100 miles from Halifax. After landing the cable at Parr Bay the Faraday will proceed to Rye Beach, N. H. Mr. Oliphant, the representative of the United States Direct Cable Company, had arrived at Halifax.

The Postal Telegraph Schemes.

ON Wednesday last the Committee on Appropriations of the House of Representatives at Washington, heard Mr. G. P. Lowrey, the attorney of the Western Union Telegraph Company, who argued against the constitutionality of the Hubbard Bill. He also introduced statistics showing the extent of the Western Union lines, and facilities, and business, and the reduction in the charges made by that company since 1868, amounting to fifty per cent., against a similar reduction through the operation of the Government telegraph in England of twenty-six per cent.

Messrs. John K. Porter and George B. Prescott, the latter the electrician of the Western Union Company, were also present at the hearing. The argument was to be continued by these gentlemen on Friday.

Telegraphic Communication with Foreign Countries.

THE Committee on Foreign Affairs of the House of Representatives have agreed to report a bill relating to telegraphic communication between the United States and foreign countries. It is general in its character, and authorizes the Secretary of State to grant permission to lay cables to any citizen or association on the conditions stated in the bill.

Foreign Telegraphic Notes.

THE natives of South America have not realized the benefits of telegraphy, except for the purpose of forming the wires into spear points, and the porcelain insulators, after being broken, into tools for scraping their spear blades into shape. But their hostility to the advance of civilization is unfortunately not confined to simply pulling down wires and breaking insulators, but takes the more serious form of violent attacks on the stations, which, although constructed like forts, and well supplied with arms and ammunition, cannot prevent fatal results frequently occurring from these sudden and desperate irruptions.

On Saturday the cable steamship Hooper left Gravesend with cables of the Central American Telegraph Company, manufactured by Hooper's Telegraph Works, to be laid between Para, Cayenne, and Georgetown, Demerara. When laid, these cables will connect the united systems of the Plato-Brazileira, Western and Brazilian, and West India and Panama Telegraph Companies, and will complete the chain of electric communications between the River Plate and the United States. The total weight of the cables now shipped on board the Hooper is upwards of 3,900 tons, the greatest weight of telegraph submarine cable taken on board by any vessel at one time.

Owing to the bad weather, the connections of the Santos telegraph cable have not been completed, and the Gomos, which arrived on April 2, still remains at Rio with the rest of the cable of the Platino-Brazilian Company.

The communication with the West Indies through the cables of the West India and Panama Telegraph Company is stated to be effected with great rapidity, the lines being in perfect order. A message sent from Demerara on the 28th of April was received in London on the same day.

The Spanish end of the Direct Spanish Telegraph Company's cable having been removed from Bilbao to Santander, direct telegraphic communication with Spain by this route has been reopened.

Mr. Wollaston writes: "An experimental line was laid in August, 1850, and the first submarine cable was submerged in September, 1851, for the Submarine Telegraph Company, between Dover and Saugette, near Calais. The cable contained four conducting wires insulated with gutta percha, protected with hemp, and externally strengthened with galvanized wire. The cable was designed in 1850; the insulated

core manufactured by the Gutta Percha Company; the cable completed by Messrs. Newall & Co., at Wapping, for Mr. Thomas R. Crampton, as contractor with the company, to which I myself acted as engineer. It is satisfactory to know that experience has so fully confirmed the opinion held by the pioneers in submarine telegraphy as to the great qualities of gutta percha as a durable insulator.

The total traffic receipts of the Great Northern Telegraph for the month of April amounted to 354,815fr. (£14,192), and for April, 1873, to 241,251fr. (£9,650). The aggregate receipts from the 1st of January to the end of April amounted to 1,332,231fr. (£53,289), and for the corresponding period in 1873 to 855,688fr. (£34,227).

A telegram, dated 18th April, from Rio de Janeiro, with reference to the telegraphic cables of the River Plate and Brazil Telegraph Company, states that the first portion of the cable taken out by the steamer Ambassador had been successfully laid from Rio to Santos and Santa Catharina, and that the steamer had returned to Rio. The remaining portion taken out from England by the steamer Gomos was to leave on the 21st April, to be laid from Santa Catharina to Rio Grande do Sul, and thence to be joined to the cables to Montevideo, which have been already submerged.

The receipts of the Submarine Telegraph Company for the month of April, 1874, amount to £8,010 against £8,093 for the corresponding month of last year.

The traffic receipts of the Eastern Telegraph Company for the month of April last amounted to £30,766, and for the corresponding period in 1873 to £30,893.

All the Flources.

THERE could be no better illustration of the progressiveness of the age than is afforded every day in the routine of a telegraphist's duty. Time was, and I remember it sadly, when your provincial novice did not plume himself on his familiarity with the ways of city men. Content was he to have a bumy tig entering his meagre business, and in relaxing his mind ever and again by such enjoyment as the work of replenishing his local battery afforded. But that was far back in the azure tinted past, when bucolic he and pastoral she, if they essayed to master the mysteries of the art at all, took their business by a register like Christian people, made no harassing remarks, and were polite to that degree that they always said "O. D., thank you," whenever you sent them a message. Those were halcyon days, truly, but the world moves in more ways than one, and the methods of men and women change correspondingly. How often, alas! in the degenerate present are we awed into that indescribable frame of mind by the fantastic behavior of the modern beginner, which causes the fountains of speech to dry up precipitately and plunges us into that peculiar agouy which overcomes us, only when we are forced to leave the observations of another unresponded to. It is a phase in life's fitful fever involving the same principle entering into the story about the man who was driving up a long and steep hill with a load of potatoes. As he neared the summit the tail board of the cart came out and away went the thirty bushels of esculents in thirty different directions. "Did you swear?" inquired a sympathizer, to whom had been related the details of the mishap. "Swear!" replied the victim, "swear!" why I knew on the start I couldn't do the subject justice, so I jest held in." I have been led into this desultory, and I fear, not very entertaining train of thought, by a little episode happening just across the aisle, and within earshot, as I sat here dating some red blanks preparatory to the grand rush soon to commence. Fred. Catlin, of the Buffalo duplex, days, has agreed to work from 5:30 until 6 o'clock for a way man, and he sails airily down the room to the vicinity of a rather "rocky" railroad wire, with that beatific expression of countenance that fits so well the face of the perfect telegrapher, and which can no more be counterfeited by a base pretender than the look which obtains on the face of the man whose turn is next in a full barber shop to borrow a bit from the Danburian. Fred. scans the solitary message on the hook, devotes himself for a moment to the list of calls tacked up before him, and, having selected his man, he proceeds to raise him. The office responds promptly, when the following dialogue ensues:

Cat. (Scrutinizing the number sheet).—"I don't see your place down here; what is the next number, please?"
 Office.—"Your next number is 1."
 Cat.—"Thank you. No. 1 Now York 9th to —."
 Office.—"Please sqe."
 Cat. (Disgusted of course).—"I sign &."
 Office.—"Never heard you in here before. Where did they dig you out? That's a hot sig. Ha! Ha!"
 Cat.—"Pls take this: No. 1 New York 9th to —."
 Office.—"Look here, young fellow, is that message City or through?"—JOHN OAKUM, in "The Switch."

Berry and his Matchlock.

DORSEY BERRY, or "Dorsey," as he was universally known, was the victim of many little accidents, etc. During the war Dorsey worked in Memphis. One evening, with some of the boys, he visited the Washington Theatre (an Army Variety). Dorsey was feeling happy, having visited "Fred's," under the office, several times before starting. As the boys were finding seats, Dorsey, looking on the stage among the ballet, recognized an old acquaintance—a dancer who had travelled with the same troupe he had several years before (D. was formerly a burnt corkist). H-h-h-hel-l-l-lo, says Dorsey, t-t-th-th-there's the o-o-old g-g-gi-gi-r-l her-her-self, and away went D. upon the stage, and catching up La Belle M. began whirling her around the stage at a lively rate, in less time than it takes to tell it. But the sport was shortlived. Down went the curtain and out went Dorsey through the back window head first into the alley, about ten feet down, thrown by two lusty supes. Dorsey picked himself up and made for the office, which he entered, looking considerably shook up. Never a word to the wondering ops, but goes for a rusty musket in the corner of the room, where, with an old cartridge box, it had lain since the capture of Memphis. Dorsey commenced ramming cartridges down the musket one on the other, relieving the monotony of the operation by ejaculations as I-I-I'll w-w-warm th-the d-d-d-d galutes—I-I-I'll sc-sc-scatter t-t-the d-d-d-d gu-gu-guer-r-r-illies. After using up all the ammunition he went for a cap, but nary a cap to be found. The boys getting a drift of his design, which was to blow up that theatre, told him he'd better give it up, for 't was no go without a cap. N-n-not by a d-d-d sight, said Dorsey, I'll t-t-touch it off with a m-m-match.—The Switch.

Miscellanea.

THE MAGNETIC EQUIVALENT OF HEAT.—There has recently been devised, by M. Cazin, in France, a thermo-magnetic differential apparatus, by means of which, it is stated, the absolute quantity of heat engendered by magnetism may be measured; in other words, the magnetic equivalent of heat may by its aid be determined. The investigator, after observing the thermic effects of magnetism on the core of a rectilinear electro-magnet, around which the wire is rolled in alternately opposite directions, so as to produce several poles, enunciates the following law: "When the alternate spirals, constructed by the wire have the same dimensions, and when they divide the magnet into several equal portions (*concomérations*), the quantities of heat created in the iron core at the opening of the voltaic circuit are inversely proportional to the squares of the number of divisions, the other circumstances not changing." For example, four similar bobbins are disposed around a cylindrical iron tube at equal distances apart, the tube extending a short length beyond the outer coils. In establishing the communications there is obtained, with the same total length of wire and the same total number of points, one, two, or four divisions. The quantities of heat decrease as the numbers $\frac{1}{4}$, $\frac{1}{9}$.

In order to measure this heat M. Cazin has constructed a kind of differential air thermometer, in which air reservoirs are used. Two or three thousand interruptions of the electric current produce, with an ordinary battery, a calorific effect very plainly measurable. By dividing the pressure observed by the number of interruptions, and making a small correction analogous to that employed in calorimetry in taking account of the cooling action of adjacent bodies, the thermic effect of the magnetism is obtained.

A Telegraphic Reminiscence.

It was in war times and during the palmiest days of "Old Ned Raymond" that the following incident occurred. The lines had been down for two days, between "Cn" and "Ku," two of the most thriving cities in the South. There was a man at "Cn" called "Shorty" for short, who was considered to be as "fast" as any in those parts.

Near the close of the second day, as everybody was awaiting further developments, the line suddenly closed, and appeared to be O. K. Ned, being seated at that table, turned up the string a little, and, to his joy, heard "Shorty" after him. Without making preparation he answered "I I Ku," and "Shorty," who was not much on the talk, when he had "biz" on hand, laconically said, "Hrs a cart load of stuff for you, 77?" Ned replied, just as laconically, "I I, let her come and cut it down close." "Shorty" started in on some "Local" he said was old enough to walk; and when he wound up with some Northern press, just at 11 P. M., and said "It's all—ur, no hair pin," Old Ned was just the Northern press and 7 "cities" behind. He gave O. K., saying "I'm a little stiff to-night—ought to see me when I'm in trin," and wrote it all out. Talk about copper-plato! The letters wore made so perpendicular you could lean on them without falling.

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Table with columns: MAY., WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows of stock prices.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each.

For the week ended May 5, 1874, and bearing that date.

150,513.—TELEGRAPHIC FIRE ALARM BOX.—John Beamer and William A. Jackson, Detroit, Mich. Application filed November 3, 1873.

Studs on endless band vibrate key lever for giving signals.

In fire alarm telegraph signal boxes the detachable endless chain N, with groups of studs n, in combination with the wheels O and O', substantially as described and shown.

150,553.—ELECTRO-MAGNETIC HOTEL REGISTER.—Louis Finger, Boston, Mass. Application filed April 5, 1874.

1. The tilting or swinging arms, or armature B, with its sign a', in combination with the electro-magnet G and the stops d and f, or their equivalents, substantially as and for purposes stated.

2. The rod or shipper C, or its equivalent, in combination with the tilting arm or armature B and sign a' and stops d and f, substantially as and for purposes stated.

3. In combination, the magnet G, armature B, stops d f, and shipper C, substantially as and for the purposes stated.

4. The soft iron lever or armature, pivoted in front of an electro-magnet, and so adjusted with relation thereto that, when the circuit is closed, the said lever will first, by attraction of the magnet, be tilted on its axis or pivot to one side of the perpendicular to such an extent that it will then, by its own weight and momentum, be caused to continue said movement and fall beyond the attracting power of the magnet, substantially as shown and set forth.

150,566.—THERMOSTAT AND THERMOSTATIC ALARM.—John H. Guest, Brooklyn, N. Y. Application filed March 14, 1874.

Thermostat bar or tube of one material, acting by lineal instead of differential expansion. Uses rubber for such bar.

1. A thermostat having its expansible or heat indicating portion, or a part thereof, made of rubber or other non-metallic solid, substantially as set forth.

2. A thermostat having its expansible or heat indicating part made of a bar or tube, acting directly by lineal expansion on the alarm or indicating apparatus, substantially as set forth.

3. The combination of a thermostat, having its expansible or heat indicating portion, or part thereof, made of rubber or other non-metallic solid with an electrical circuit, substantially as set forth.

4. The combination of a thermostat having its expansible portion, or part thereof, made of rubber or other non-metallic solid, with devices indicating the temperature, substantially as set forth.

5. The combination, with a detent or circuit controlling device, of a thermostat composed of a bar or tube of one homogeneous metal, acting directly thereon by lineal expansion, substantially as set forth.

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All orders dated on and after June 1st will be filled with the new style, polished, "Snapper," at the original price of 30 cents, or 6 for \$1.50.

A few of the old style will be closed out at 25 cts, or 6 for \$1.25. R. W. POPE, P. O. Box 5278, New York. New York, May 30, 1874.

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The "Snapper" Sounder, plain.....30c. 6 for \$1.50. " " " nickel plated spring... 0.40. or 6 for..... 1.80.

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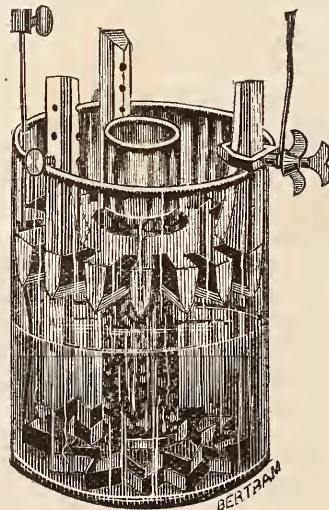
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A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

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This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenroek, Franklin, Canton, Dalihard, Watsou, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Oersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacohy and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinhell, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

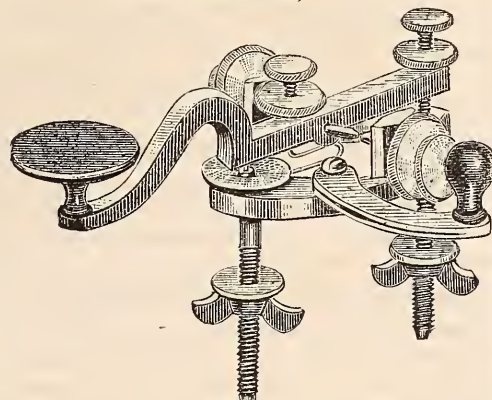
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The publishers will be announced hereafter.

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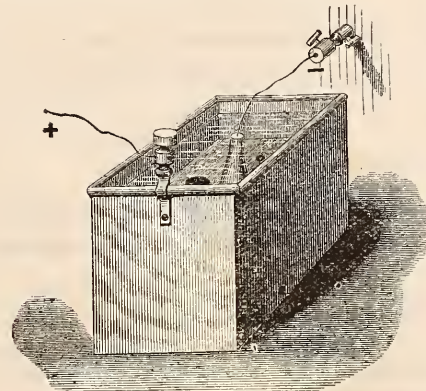
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VAUGHAN'S AUGURS and TOOLS in variety.
SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
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Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
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Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original **FARMER & CHANNING PATENTS**, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

QUICK SALES, SMALL PROFITS AND SUPERIOR GOODS.

We are offering any of our unequalled Telegraph Instruments at 20 per cent. discount from list prices.

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TELEGRAPH ENGINEER,

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INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made.

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 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

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constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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COPPER FOR CONDUCTIVITY.
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The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
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And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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 It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up
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 ETC., ETC.,
 OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS IN
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OF
 EVERY DESCRIPTION,
 38 VESEY STREET, New York.
 NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
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In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

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 For Amateurs and Learners, and Short Lines.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the
EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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THE GREAT RUSH
AT No. 8 DEY STREET
 is caused in part by the offer of 20 per cent. discount from list prices on all Telegraph Instruments manufactured by
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 8 Dey Street, N. Y.

REDUCTION OF PRICES.
POPULAR, EXCELLENT and ECONOMICAL.
THE NONPAREIL TELEGRAPH APPARATUS,

For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, *nearly 2,000* have been sold, and they are constantly more and more sought after.

Hereafter we shall furnish them at the following popular rates:
 Single Instruments, including Three Cells Battery, Connecting Wire, Chemicals and Instruction Book..... \$6 50
 Two sets of Instruments, etc..... 12 00

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with Complete Instructions, Battery, Wire, etc.,
GIANT SOUNDERS,
Improved Curved Keys,
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Send for Circulars and Catalogue.

DR. L. BRADLEY,
 No. 9 Exchange Place,
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Has discontinued the manufacture of Telegraph Instruments, and is now giving special attention to the manufacture of his

UNIVERSAL APPARATUS
 FOR

ELECTRIC MEASUREMENT,

Which consists of his Tangent Galvanometer and his Rheostat as they have been recently improved, which, taken separately or unitedly, constitute a means for correctly determining the resistance of all conductors of electricity; the resistance and insulation of telegraph wires; the location of breaks, faults, crosses, &c.; the relative specific resistance and conductivity of metals and other conducting materials; the resistance and electro-motive force of batteries; as well as the strength, quantity, or electro-chemical equivalence of all currents of dynamic electricity. The capacities of all other instruments for similar purposes combined, are embraced in this one. Its measurements are accurate and absolute, and are easily read off in British Association units, without the necessity of arithmetical calculations. It packs in a case seven inches deep and nine inches diameter, with a handled strap, convenient for safe transportation. Considering the wide range of its capacity, it is cheaper than any other instruments.

Price of apparatus complete, is \$200 to \$230, according to style, &c. Price, Tangent Galvanometers, \$40 to \$60.
 Descriptive pamphlets may be had on application.

He also pays special attention to the manufacture of his

CELEBRATED HELICES
 WHICH ARE OF
 Naked Copper Wire,

So wound that the convolutions are separated from each other by a regular and uniform space of the 1-800th of an inch, the layers separated by thin paper. In Helices of silk insulated wire, the space occupied by the silk is the 1-150th to the 1-300th of an inch; therefore a spool made of a given length and size of naked wire will be smaller and will contain many more convolutions around the core than one of silk insulated wire, and will make a proportionally stronger magnet, while the resistance will be the same.

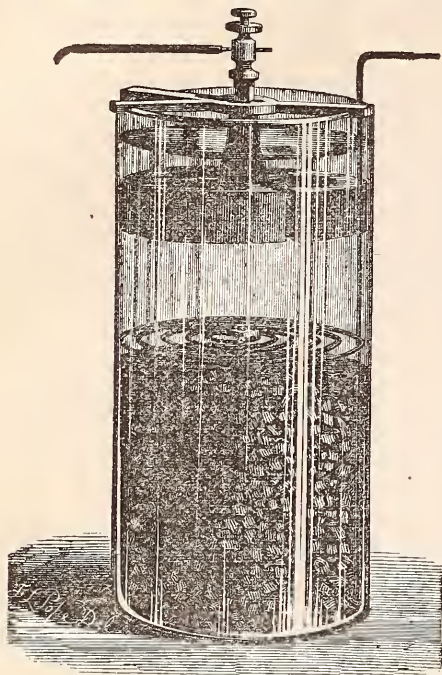
These Helices are now offered for the use of manufacturers of Telegraphic and Electrical apparatus, and orders will be filled promptly and on reasonable terms.

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we will contribute to the good work, by offering our Superior Telegraph Instruments at 20 per cent. below list prices. Quality will be strictly maintained.

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THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR,** without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION, and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY, or for any purpose requiring a uniform, powerful and constant current.

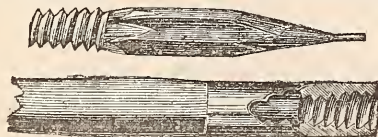
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. *Send for Circular.*

L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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UNION BRAND, AND UNION BRAND EXTRA QUALITY.

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Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

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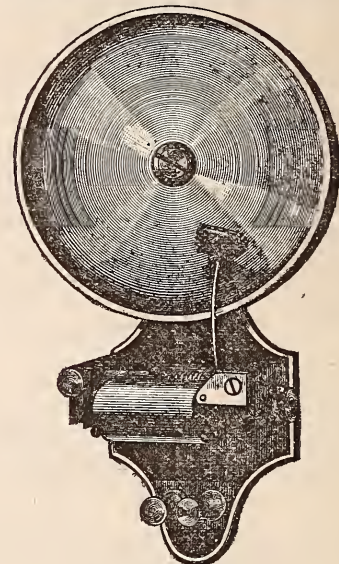
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One half of actual size

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Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

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 - Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight.. \$50 00
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At unusually low prices.

Battery Carbons all sizes, with Improved Connection
MEDICAL BATTERIES FROM \$4 UPWARDS.

ALL GOODS WARRANTED FIRST CLASS AND PRICES EXTREMELY LOW.

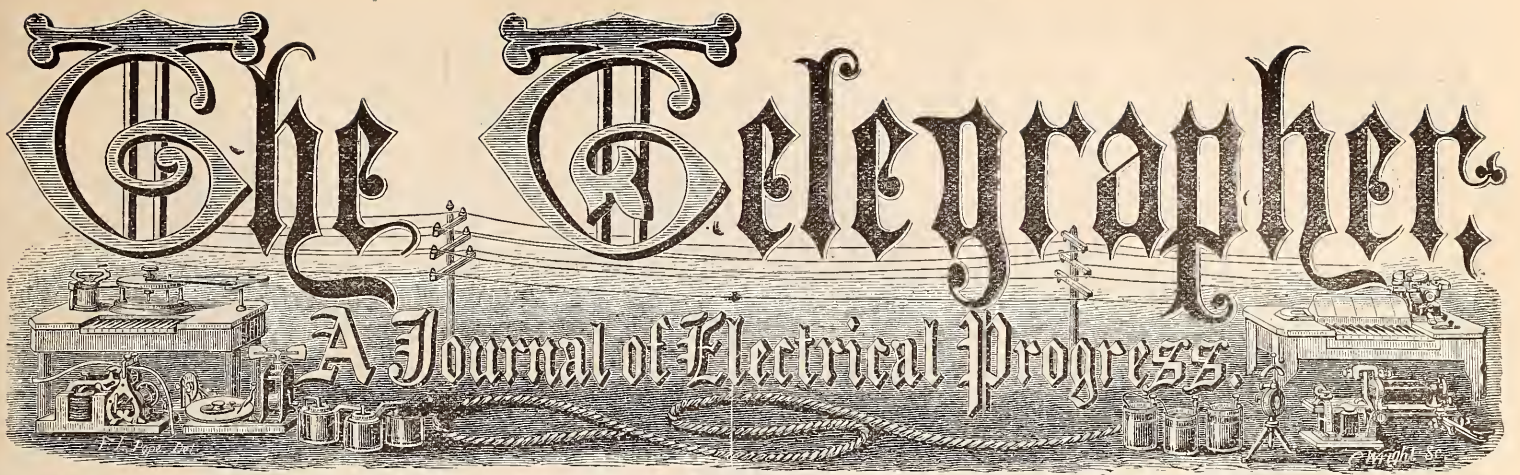
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, June 6, 1874. Whole No. 412

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MANUFACTURER OF
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TELEGRAPH MATERIALS AND SUPPLIES
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All kinds of Electrical Instruments
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WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
Western Electric Manufacturing Company,
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(ESTABLISHED 1856.)
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has for sale the various kinds of Office and Magnet Wires, in-
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FIRST CLASS TELEGRAPH INSTRUMENTS
at 20 per cent. discount from price list.
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Having recently enlarged our factory, we are now prepared
to furnish at short notice any style and quantity of
BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes
the most durable, handsome and best insulated Braided Wire
manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires
covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Compa-
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portion of the office wire used by them.
Sample Card and Price List furnished when requested.
Phillips' Wire can be had of
L. G. TILLOTSON & Co. New York.
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PARTRICK, BUNNELL & Co. Philadelphia.
WATTS & Co. Baltimore.
CHARLES WILLIAMS, JR. Boston.
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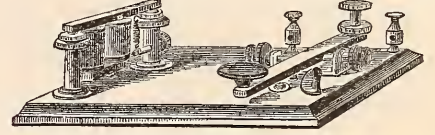
E. F. PHILLIPS, Esq.
Dear Sir: Your office wire is a decided success. We have
used it exclusively for two years and consider it the best in the
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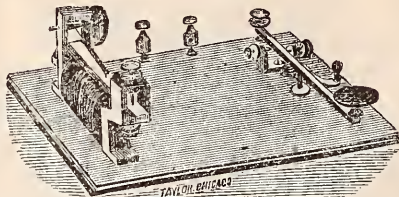
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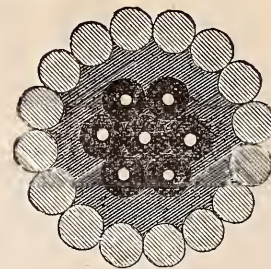
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JUNE 6, 1874.

VOL. X. WHOLE No. 412.

Original Articles.

[From The Ghost of Telegraphica.]

Bad Medicine.

THOSE good old times when mischievous members of the fraternity amused themselves by sending "specials" from ostensibly distant points to their fellow operators in the same office, or worried some credulous brother by sending to him on the local from the battery room, and continued to send despite the desperate efforts of the receiver to break—those happy days have flown forever. Your modern man of the key has long since "tumbled." There is no game to be got out of him, as a general thing, and the oft repeated attempts to "guy" him "mit ter pack schtroke," or otherwise, in nearly every case end in bringing confusion on the perpetrator of the fraud. Many and ingenious are the jobs put up at the expense of novices and the absent minded and unsuspecting "old 'uns," but the only one of which I have knowledge, that has been carried out with much show of success, is embodied in the sending of a bogus message having a wrong check, so worded that when the sender, commencing at the period, gives the letters, some indecorous phrase is spelled out, much to the astonishment and chagrin of the receiver, and which enables him to see the joke instantly.

To illustrate this, for the benefit of those who have never been victimized, let me relate that, stepping into a Jew store on Chatham street, a while ago, I bought the grandest looking vest I ever saw for a dollar. The circumcised villain measured me, and, referring to sundry tags sewed on to the garment at divers points, assured me that it was made for his brother-in-law in Paris, and would "fit me like the baper on the wall." In the trusting innocence of my heart I bought the waistcoat, and so great is my faith in human nature that I didn't try it on until I reached home. Well, you ought to have seen it. Like the fiddle in Handy Andy's conundrum, "it was the shape of a turkey and the size of a goose," and it fitted me about as well as a soldier's overcoat would fit a harberry bush. The Israelite in attendance told me, when I called for satisfaction, that his brother "was died" last night. He alluded to the individual of whom I made the purchase, and I deeply sympathized with him in his bereavement, and went home in quite low spirits. With womanly shrewdness my wife harnessed the vest one day, and, taking enough out of the back to make young Oakum two suits of home clothes, she returned it to me, saying she hoped I could make it go now, and get my money's worth out of it at least. So, after that, when I was unusually courageous, or got on a fit of despondency, and wanted all Broadway to think I was a mountebank retired to private life, or a three card monte man revelling in the gay metropolis prior to his departure to Coney Island for the season, I lost myself in that gorgeous garment and groped over to the office. To say that my appearance elicited frequent and painful remark from the operators about me would be but to faintly hint at the shower of slurs and innuendoes which my appearance, in connection with that vest, always provoked. It was on one of these occasions that I received the following message, sandwiched in between a half rate and a special, and checked about seven words out of the way:

"When it left last year on upper end, very early reached. Smith has often ordered the things. He also thought very early, said this."

The sender insisted there were thirty-one words, and, according to custom, went ahead period, when I found myself questioned as follows:

"Will you ever shoot that vest?"

By what means the interrogator, many miles distant, came to know of my magnificent article of apparel I leave to others to explain. Suffice it, that at this writing the cause of my tribulation forms an important feature in a rag carpet adorning my mother-in-law's back parlor. I am teaching all the vagabond boys in my neighborhood now to go down in front of that Chatham street store and cry, "I sell sheep." Not that it does those precious Jews any harm, but it amuses the boys. I have no conscientious qualms about this either; for, while it may be regarded as a pernicious habit, it has been productive of good results—

my especial favorite, who "was died" last night, having been resuscitated to an extent enabling him to bound over the counter and get out on to the teeming thoroughfare in precisely seven seconds—which isn't slow for a dweller in that shady bourne from which no traveller returns. But, after all, the sending of those messages is no evidence of smartness. As long as they are sent to other people I enjoy them; but, somehow, I never could see the application of such things when my own dignity is involved.

Now on the cable lines they have a much better way of making their little points; and it is really refreshing to note the way they do "fool" their best friends, and it is intensely funny, moreover, to observe how mad their best friends get about it. A few evenings since an attempt was made to send the appended message to Plaister Cove:

"Nicodemus 42 1/2 sibolet h wayland
eezezeceous oxford Tyndall lowgrade
ziphocerionosophy cantab receicacerous
licoriceroot evenciyelt veyonyi
sampon outmass sympathy lacking
hevenswotafule every thing wrong in taking
advantage our good nature rubblind
sigglecicelyt ciceroneous verniedrimggesillschraft
48529 odontucityet tumblefuvercan—"

How would you like to struggle with that? Of course you wouldn't; no more did the brave Bostonian now working in Plaister Cove. He broke and broke; then he called for Cottrell, saying, "Cot can send those words to me so I can get 'em." But when it was attempted he got wilder than before. It wasn't intended that he should "get it," and he didn't. After half an hour's trying there was an exchange of compliments, and the two offices became intensely personal in their expressions of regard. "Gs" finally said "he would send the message to Duxbury on the other wire, and report the matter at headquarters." Plaister Cove said "Gs" could report and he hanged. It might lose him his situation, but there was no help for it; he might guess at these words until Greenland froze over (it strikes me he said Greenland), and he couldn't get them then unless they were spaced better." The matter ended there for the night, but next day "Gs" relieved the anxiety of the Plaister Cove man (who expected, every time he heard the cable room call, that his discharge was coming) by letting him into the joke, and assuaging his grief at the trick which had been played on him, by saying: "Never mind, Jack, we will come it on Duxbury to-night, and you may help us." It is a great relief to feel that some one is going to be victimized as badly as we have been—that is, human nature the world over—and so Jack came to think it was a pretty good joke after all, particularly as he was to assist at the coming slaughter.

The next night Boston was asked to put Duxbury and Plaister Cove on the same wire, as he is often asked to do nights, to facilitate the handling of business by "Gs." The message given above was addressed to a well known house in Havre, and Leslie proceeded to give it to Duxbury at a moderate rate of speed, and with apparently the greatest care, but in reality mixing up the spaced letters in a manner fearfully artistic and puzzling. The Duxbury man "weakened" perceptibly. No one but those who "took it in" can imagine the degree of merriment the task of transmission elicited. It was never finished, and the upshot of the attempts in that direction was that the victim became as wild as his brother in Plaister Cove had been the night before, compliments and words of fraternal affection being in order, as usual. And if he was indignant before, fancy his boiling wrath when told that the Duxbury men were a set of old grandmothers any way, and that no trouble was ever experienced in getting business to Plaister Cove—to prove which the tormentor called the latter office and sent the message to Jack at the highest rate of speed attainable. The key had hardly closed when "O. K. F." came back sharp and clear, and "Gs" was happy. But the feelings of that Duxbury man, who had hitherto hugged the flattering unctious to his soul that he could take anything in the way of dots and dashes that mortal man can take (and he can, too, no doubt), I shall not attempt to describe. He has never "dropped," and never will until he sees this, I presume, and then—

"Angels and ministers of grace defend us!"

I suspect his wrath towards "Gs" will vanish like the fabric of a dream in the presence of his devouring wish to punch the head of the chronicler of this episode.

JOHN OAKUM.

THE position of Superintendent-in-Chief of the Government telegraphs in Japan has been offered to and accepted by Mr Edward Gilbert, telegraph engineer and Superintendent of the North British Railway. Mr Gilbert, who has been engaged in the telegraph service of the Electric and International Company, the Caledonian Railway and the North British Railway, for a period of twenty-seven years, will, it is understood, leave England for Japan, shortly to assume the duties of his office.

[From the Journal of the Society of Telegraph Engineers.]

On some Points in Connection with the Indian Telegraphs.

BY W. E. AYRTON.

THIS paper is not intended to be at all a complete account of the Indian Telegraph, for to enter at length into the details of this or any other telegraphic administration would require a book rather than a single paper. I have, therefore, only ventured to select one or two points that I thought might be of general interest.

It may be stated, in commencement, that throughout the greater portions of India there exist two distinct lines of telegraph—one in possession of Government, the other in the hands of the various railway companies. These two sets of lines are almost entirely distinct, being under separate management and worked by different sets of employes. The rules, however, relating to tariffs and the reception of messages are the same for both systems, and a message may be conveyed partly over the Government and partly over the railway lines at a single cost to the sender. With this sole exception the two sets of lines differ so widely that I wish it to be understood that anything I say hereafter refers only to the Government, and not to the railway telegraphs.

The application of the laws of electricity to the practical purposes of testing, and to the determination of the best form of instruments and the most suitable arrangement of batteries, having been somewhat developed in India, I have entered somewhat at length into this subject. Many other branches, however, equally important, I have been compelled to leave untouched.

Testing of Lines.

Regular testing of the lines was first introduced into India about the year 1868, and since that time the advantage of executing these tests has been more and more fully appreciated. Every important line is now tested two or three times a week, in the following manner:

With a Wheatstone's bridge or a differential galvanometer observations are made, with both positive and negative currents, of the resistance of the line under the three following conditions:

- 1st. When put to earth through the relay at the distant end.
2d. When put direct to earth (that is, relay short circuited).
3d. When insulated at the distant end.

From the six values thus obtained the following are calculated by equations,* suited to the form of testing instrument employed:

- 1st. The electro-motive force of the natural line current in terms of that of the testing battery, usually 40 cells.
2d. What the apparent wire resistance (A) of the line, including the relay at the other end, would be were there no natural line current.
3d. What the apparent wire resistance (B) of the line, exclusive of the relay at the other end, would be on the same supposition.
4th. What the apparent insulation resistance (C) would be also, on the same supposition. The object of determining (A) at all will be seen hereafter.

If the natural line current be large, so that there is a considerable difference between the observed values obtained with the positive and negative currents, then the real values differ much from the arithmetical mean of the observed values.

The equations from which (A), (B) and (C) are calculated are determined on the supposition that the difference between the positive and negative readings is due to a natural current, uniform throughout the whole line. This is, of course, frequently not the case, as

* N1 - P1 / (P1 + N1 + 1) E

= (N2 - P2) / (P2 + N2 + 1) E also

A = (m1 / l1) * (h(P1 + N1) + 2 P1 N1) / (P1 + N1 + 2 P1)

B = (m2 / l2) * (P2^2 + N2 + 2 P2 N2) / (P2 + N2 + 2 P2)

C = (m3 / l3) * (P3 + N3) / 2

where e is the electro-motive force of the natural line current (earth current), E that of the testing battery; P1, N1; P2, N2; P3, N3 the values obtained with positive and negative currents respectively in the three tests, and l1, m1; l2, m2; l3, m3, the three sets of branch resistances l1, l2, l3 being opposite in the bridge to the unknown resistances.

As the difference between the positive and negative values in the insulation test is frequently due more to chemical action than to a natural current, the arithmetical mean of the two readings obtained, when each current is kept on for the same time, gives, perhaps, the best approximation to the true value.

when, for instance, the natural current flows towards each end of the line, from about the centre, the connection between the line at that point and the earth being formed by dirt or moisture accumulated on the insulators. In such a case, however, it is extremely difficult to ascertain the distribution of the natural potential at different points of the line, and, in addition, the equations for determining the true means from the positive and negative readings, become much more complicated and unsuited for practical use.

The next point to consider is that if the line be long or badly insulated, then (A), (B) and (C) will not represent respectively the real values of the resistance of the line, including the relay, and of the insulation, because in each case a complicated circuit has been tested, consisting partly of wire and partly of insulation resistance. In fact, on such a line (A), (B) and (C) are often very nearly equal to each other, (A) and (B) being less and (C) greater than the true value. For determining (W) and (I) the real values of the resistance of the wire and of the insulators independently of one another, the following two equations are used:

$$W = 2(C - \sqrt{C^2 - B})$$

$$I = \sqrt{C(C - B)}$$

—which are calculated on the supposition that the resultant fault is electrically in the centre of the line, by which I mean on the supposition that the real wire resistance of the line is the same from each end up to the point at which a single leakage could be substituted for all the different leakages without altering the electrical condition of the line. This, of course, is not always the case—for instance, when one end of the line is worse insulated than the other. The same equations for determining from (B) and (C) the real values (W) and (I) are, however, for simplicity always used, and their accuracy in any particular case tested as follows: If the resultant fault be really at the electrical centre of the line, and consequently (W) and (I) be the true values, then the resistance of the relay at the other end should—as could easily be shown—be given by the fraction.

$$\frac{C(A + B)}{C - A}$$

What this resistance actually is can be ascertained by inquiry, for the resistance of every relay in use in India is stamped upon the instrument. If it be found that this fraction gives a value ^{larger} than the true resistance of the relay, then it is known, as may be easily proved by a simple calculation, that the resultant fault is ^{farther from} the testing station than the distant station, and also that the equations used for determining (W) and (I) have given values somewhat ^{larger} than the real wire and insulation resistance. In this way the position of the resultant fault is roughly determined, from which we know the relative insulation of the two halves of the line; and in the case where the resultant fault is about at the electrical centre of the line, then the real wire resistance, and the real resistance of the insulators, quite independent of one another and of all natural line currents, are also found, no matter how badly the line be insulated, nor how strong the natural line currents be, provided they be only constant during each pair of tests. In the case where the resultant fault is not at the electrical centre of the line, then values differing somewhat from the real wire resistance, and the real resistance of the insulators, are determined; but whether they are larger or smaller than the true values is also known.

As an example of the importance of their consideration, I will take the following:

Let the line under test be 500 miles long, and let the relay at the distant end be known to have a resistance of 2000 ohms.

Let A = 3884.6.
 " B = 3611.
 " C = 4500.

Now, if these were taken as the real values, without any correction being applied, we should say that the wire resistance per mile was $\frac{3611}{500} = 7.22$ ohms, and that the insulation per mile was $\frac{3884.6}{500} \times 4500 =$ about 2.2 megohms.

Now from the two equations (1) and (2) we have

$$W = 2(4500 - \sqrt{4500 \times 889}) = 5000.$$

$$I = \sqrt{4500 \times 889} = 2000.$$

$$\text{And } \frac{C(A - B)}{C - A} = 2000, \text{ about.}$$

We know, therefore, that the resultant fault is at the centre of the line, or that the leakages in the two halves of the line are similarly distributed with reference to the centre; consequently the values of (W) and (I) given by equations (1) and (2) are correct. The real wire resistance per mile is therefore $\frac{5000}{500}$, or 10 ohms, and the real insulation per mile $\frac{2000}{500} \times 4500$, or 1 megohm. The values, therefore, obtained for these without applying the correction are respectively 40 per cent. too small and 54 per cent. too large.

In all cases, of course, the exact position of the re-

sultant fault, whether it be at the electrical centre of the line or not, could be determined, and afterwards the true values of the wire and insulation resistance; the exact calculation, however, becomes exceedingly complicated, except when the resultant fault is at the electrical centre of the line.

It is of course very difficult to localize faults accurately upon a line on which the normal absolute insulation is not much greater than the absolute wire resistance, since the worse insulated a line is in its usual state the more difficult it is to localize any extra leakage.

Theoretically correct results can be obtained for "earth faults" by the use of the "centre of gravity" method. To do this, however, it is necessary to know what would be the magnitude and position of the resultant fault, supposing the extra fault, the position of which it is attempted to localize, did not exist. Now, in practice it is almost impossible to ascertain this, since the magnitude of the resultant fault, which is the absolute insulation of the line, varies perpetually during the day and night, even when the line is in good order, and it is almost impossible to predict accurately what it would be at any particular time. A simple correction, however, can be applied to the results obtained by the ordinary tests for "earth faults" and contacts, if it be remembered that the effect of the general leakage of the line is to make the fault apparently farther from the testing station than it really is, if it be in the near half of the line, and nearer to the testing station than it really is if it be in the distant half of the line. Taking into account this consideration, faults are usually localized in India to within one or two per cent. of their real distances. A great deal, of course, depends upon the individual skill and judgment of the tester.

Method of Making the Tests.

The routine for testing is as follows: The testing station commences by calling the nearest station in circuit on the line to be tested, until this station replies and signs. The testing station next signals the word "Testing." The operator at the distant instrument upon receipt of this at once calls the telegraph master (office manager), who gives his initials and takes charge of the instrument himself until the testing is completed. The testing station now signals "Circuit," on which the telegraph master leaves the instrument and line alone until he hears his station called again by the testing station. After the word "Circuit" has been signalled the resistance of the line, including the relay at the other end, is found. Next, the testing station signals "Conductor—minutes;" to which the telegraph master replies with the temperature (dry and wet bulb) at his office, and at once puts the line direct to earth, short-circuiting the relay for the specified time. The resistance of the line excluding the relay is then found. The testing station next signals "Insulation—minutes;" to which the telegraph master replies with the state of the weather and at once insulates the line for the length of time specified. No conversation of any kind, beyond the above, is allowed, unless, of course, the testing station asks some particular question. By following out this routine rigidly the tests are performed with certainty and despatch. When it is required to test a line beyond an office usually in circuit, this office receives orders, "Testing; join a certain line—minutes;" in accordance with which that office short-circuits its galvanoscope, etc., and joins over the particular line for the length of time specified, exactly as if that line did not come into the office at all.

In the case of faults, to determine the position of which I may mention tests are always made at once, day or night; the testing station signals its orders as insulation, conductor, loop, &c., in the ordinary way, provided that communication on all wires in the faulty section be not interrupted. When, however, a post, for instance, has been blown down and all the wires have been tumbled into water so that it is impossible to communicate on any line, then, at the commencement of the next hour (Madras time), three or four o'clock, or whatever it may be after the fault has occurred, the office at the end of the interrupted section insulates all lines from the hour to fifteen minutes past the hour; then puts them to earth through the relay for fifteen minutes, then puts them to earth for the third fifteen minutes; and, for the last fifteen minutes of the hour, loops the wires in pairs, previously settled in printed instructions supplied to each office. This routine is repeated every hour until communication is restored. In this way the testing station knows at any moment exactly what is being done with the ends of the lines at the next office beyond the interruption, and so is frequently able to localize faults, although communication on all lines has been stopped.

After the fault has been localized a telegram is sent, if possible, to the office nearest to the fault, telling them where to send a man and what sort of a fault to look for. In this way one man going from the nearest office is able to remove the cause of the interruption, whereas before the introduction of systematic testing in India, two men travelled along the line, one from each

of the stations at the end of the interrupted section, until one or the other found the fault. These men could not travel at night for fear of passing the interruption, whereas now they may start at once and travel by the most expeditious means up to the spot at which the testing shows the fault to be. Thus interruptions are not only removed at less expense, but, in addition, in a much shorter time than formerly.

I may mention that, where faults have occurred during the night not many miles from the testing station, and on lines whose normal insulation was good, I have, on a few occasions, by localizing the position of the faults very carefully, succeeded in having them removed during the night by men sent out with lanterns, so that scarcely any interruption whatever to the traffic has been caused.

All tests, ordinary and fault, are carefully worked out and tabulated at each testing station, and reports are sent weekly to the office of the Electrical Superintendent in Calcutta for recalculation and combination in bi-yearly reports for submission to the Director General. In this way the electrical history of each line is carefully recorded, from which the relative qualities of the different lines are derived, so that the best lines can be portioined out for working direct the longest distances.

(To be continued.)

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.

WASHINGTON, D. C., June 3.

TO THE EDITOR OF THE TELEGRAPHER.

LESS than three weeks of the present session of Congress remains, and both houses are working industriously to get through with the business which is absolutely necessary to be done before the adjournment.

As there is scarcely a probability that any action will be taken on telegraphic matters during the brief time remaining, any information under the familiar heading of my communications can scarcely be expected to prove of engrossing interest. Still it is necessary that the record should be as complete as possible for future reference, and that we may know hereafter where to pick up the thread of events.

The House Committee on Foreign Affairs have agreed to report a bill relating to telegraphic communications between the United States and foreign countries, general in its character, and under its provisions the Secretary of State is authorized to grant permission to lay cables to any citizen or association upon the conditions prescribed. Similar bills have been presented and reported heretofore, and one or two have passed either the House or Senate, but have ultimately failed to become laws. It is not likely that any definite action can be had on this new bill at this session. It will be reported and go over with the unfinished business.

There was on Wednesday of last week another session of the "Wm. Orton and Gardner Hubbard Debating Society"—this time before the House Committee on Appropriations. The Western Union Company was represented by their counsel, Messrs. Lowrey and Porter, of New York, and Mr. Geo. B. Prescott, their electrician was on hand with the usual amount of statistical information. Mr. Hubbard was also present, but he had had his say previously, and therefore did not attempt to enlighten or begot the Committee.

Mr. Lowrey addressed the Committee at some length, arguing in the first place that the scheme of Mr. Hubbard is unconstitutional. This was rather a new point to the latter, and did not seem to strike him favorably. Mr. Lowrey proceeded to introduce statistics, prepared by Mr. Prescott, which may be of sufficient interest to present to the readers of THE TELEGRAPHER, showing that the Western Union Company operates more miles of telegraph line than all Switzerland, Sweden, Holland, Belgium, Hungary, Spain, Bavaria, Denmark, Norway, Portugal, Greece, Wurttemberg, and Great Britain combined. It operates more miles of telegraph, and annually transmits more messages than all Germany, Spain, Hungary and Russia, notwithstanding the fact that these countries have nearly the same area of territory, and nearly four times the population of the United States. Europe has a population of 300,000,000, and sends annually 50,000,000 messages, being one message to six persons. The United States have 40,000,000 inhabitants, and the Western Union Company alone sends 15,000,000 messages, being one message to two and a half persons. In 1866 England had 80,466 miles of telegraph wire, and, in 1873, 103,402 miles, being an increase of 22,936, or 28 per cent. In 1866 the Western Union Company had 75,686 miles of telegraph wire, and in 1873 173,517, being an increase of 97,831, or 120 per cent. In 1866

England had 2,151 telegraph offices, and in 1873 5,474 do., being an increase of 3,323, or 154 per cent. In 1866 the Western Union Company had 2,250 offices, and in 1873 5,955, being an increase of 3,705, or 164 per cent. In 1867 England transmitted 7,500,000 messages, and in 1872 14,858,000, being an increase of 7,358,000, or 98 per cent. In 1868 the Western Union Company sent 5,733,394 messages, and in 1873 13,362,832, being an increase of 7,629,438 messages, or 133 per cent.

In 1868 the average toll upon the English lines was 38 cents per message. In 1874 the average toll is 28, being a reduction of ten cents per message, or 26 per cent. In 1868 the average toll upon the Western Union lines was \$1.10 per message, and in 1874, 55 cents, being a reduction of 55 cents per message, or 50 per cent.

Another hearing was to have taken place on Friday, but the committee came to the conclusion that the pressure of business upon them was too great to admit of their devoting any more time to the subject at this session: and so notified the parties, but adding, that any briefs that might be submitted would be carefully considered.

Judge Porter was to have addressed the committee on Friday on behalf of the Western Union Company: and there is room to believe that it was fortunate for Mr. Hubbard that the matter went over, as he would have been likely to have suffered somewhat severely had the Judge an opportunity to take him in hand.

This ends the farce for the present session, and it is to be regretted that it is in the power of any person to renew and revive it another session. It is conceded on all hands that neither Mr. Hubbard's mongrel scheme, nor a Government Telegraph proper, stands any chance; and it is under the circumstances unjustifiable that the telegraph interests of the country should be put to constant trouble and expense to defend themselves against the selfish attacks of any man or set of men.

In order to make his continued residence in Washington profitable, Mr. Hubbard is engaged in various lobby schemes, notably that of the several Bank Note Engraving Companies in their contest with the Treasury Department for the printing of the currency, which, under existing laws, has been transferred to the Department.

CAPITOL.

A Slow Telegraph Repair Steamer.

NEW YORK, May 25.

TO THE EDITOR OF THE TELEGRAPHER.

THERE is always something fascinating for a landsman about the ocean, particularly when there is a wind sufficient to bring in the white capped waves. I had the good fortune, recently, to take a short excursion down the Bay, on the repair steamer William Orton, belonging to the Western Union Telegraph Company. The trip was one of business, of course, but I was fortunate enough to secure a passage; and, for one who is confined within four brick walls, week in and week out, such an opportunity was not to be neglected.

Well, we cast off from the splendid new stone pier, belonging to the Government, at the Battery, about nine o'clock in the morning. The weather was fine, and we took but little heed of time or surrounding objects. The fresh salt breeze was all that we could desire. We started out in company with the Staten Island ferry boat, and we had no idea but what the Orton would walk over the course and distance the ferry boat without the least trouble. As I said before, we paid but little heed to surrounding objects; the "bating breezes" was all that we could enjoy. After about an hour's sail a ferry boat crossed our bow, bound to New York, and, upon further investigation, we found it to be the same boat which left the dock with us. She had made her trip to Staten Island and was on her return, and we were not yet at the first landing. The feeling of perfect satisfaction now changed to one of disappointment. We had before us yet a long voyage, and every tow boat, ferry boat, and even sailing vessels, passed us, and the feeling came over us that we were being laughed at by all those we met or those who passed us. We wanted something more than the invigorating sea breeze to cheer up our drooping spirits; but we had no alternative but to stand by our ship.

In due course of time we made the Narrows. High 12 was fast approaching. The Orton not being expected to make long voyages, her larder was not supplied with anything like the prodigality of a Cunard or White Star steamer. Dix Island was the objective point, and we were now through the Narrows, with a strong S. E. breeze, and a pretty good sea was setting in. Our pilot was supposed to know all the intricate windings and turnings of the various channels, and that we would soon be at our destined haven. We were making a bee line for the island, when all at once we felt a tremendous thump. Ding-dong went the bell, and thump we went again on the shoal. After a long time we succeeded in backing off, and, by a circuitous route, finally reached the island, with appetites ravenous. Mr. Brown, manager from the main office of the Western Union Telegraph Company,

145 Broadway, made tests of the cable connecting Dix Island with Staten Island, which was the object of the expedition. Mr. Roach, in the mean time, had secured a loaf of bread and some cheese, and, when fairly on board the Orton, the viands were spread on the top of a barrel, and the way we poor, half famished mortals laid to would have been a caution to a boarding house keeper, provided we were to be judged by the manner in which we made way with the bread and cheese. It was really a "feast for the gods."

After our appetites were appeased, the next important question was, at what time should we reach New York? Some of the party had engagements at five o'clock. We reached the Narrows at three o'clock. The Orton was doing her best, but, the tide being against us, we could make but little headway. It was finally agreed that we should stop at Quarantine, so that those who choose could take the four o'clock ferry boat. The Orton made her dock at about six o'clock, and a happier set of fellows was never seen than we were when again on terra firma.

The Orton is a good boat, and well adapted for the use for which she was intended, i. e., laying and repairing telegraph cables; but it was, no doubt, a great error in not putting into her a twenty inch cylinder instead of the fourteen inch one with which she is provided, then she would have power and a good rate of speed.

LANDSMAN.

A Defence of Tobacco and Tobacco Smoking Telegraphers.

TO THE EDITOR OF THE TELEGRAPHER.

"Tobac ist mein leben,
Tobac ist mein lust."

THE several writers on the subject, from Miss N. B. down to "Elias"—the former being a young maid, the latter an old one—have decided, in their own minds, at least, that "ladies dislike cigars, therefore men should never smoke."

Although it is well known that tobacco smoke, when issuing from a cigar held in the lips of a brother is far more obnoxious to the average feminine nose than when a cousin indulges in the weed, especially if he be "one who makes himself at home about waists;" yet, notwithstanding this fact, we will admit, for the sake of peace, that of the foregoing syllogism thus much is correct—"Ladies dislike cigars"—but we fail to see that "therefore."

Ever since Eve made Adam eat the apple (she had been smoking cigarettes, and tried apples to destroy the scent—they are of great utility in that respect—and was disposed to be even less selfish upon finding they acted upon her quite emetically) the ladies, bless 'em, have had their own sweet way, and it is about time some poor masculine entered at least a protest against this sort of thing.

Men like to smoke, therefore ladies should overcome their dislike to the fragrant narcotic, or, at least, should endeavor, as befits their gentle nature, to wean, as it were, the man from his love of tobacco. This is, surely, a better way than to say, "There's that great, nasty, black pipe again! Take it away from here, or I'll break your head with this broom! Do you hear?" The man and his pipe go out together, but he lights it again, and under its magic influence all his angry thoughts concerning that gentle spouse vanish in clouds of incense; whereas, had he not this consolation, his anger might have so far overpowered his usual wisdom as to cause him, in a moment of passion, to actually "spank" that woman! The thought overpowers me—I must light a cigar.

"Thy gentle spirit lulls the laboring brain, lured back to thought the flights of vacant mirth"—which reminds me that tobacco is a sedative, when not taken to excess. Many young men are troubled with an overplus of "nervous vitality," the effects of which are a loneliness, and a desire for company of some kind, even when so situated that to go into society is next to impossible. We, ourself, live two miles from a young lady—we live three miles from another one, but we don't mean her—I (following John Phoenix's example, I drop that "we," I'm not used to it) am busy all day, and at night, if any one was with me, I should not smoke; but as it is, I light a cigar and am contented. Miss N. B. would probably advise, "Get married."

No, thank you—"a young man married is a man that's married." As a pickpocket observed, on running into the Y. M. C. A. rooms because a man was beckoning to a policeman, having missed his wallet, "Of two evils, I prefer the lesser."

Is smoking the only thing which becomes a bore when out of place? "There is a time for all things," and that young man who offends the public by smoking in his office does not deserve a—pipe of tobacco. With the exercise of a little common sense respecting time when and place where one smokes, nobody's olfactories need be offended. My letter and cigar come to an end together.

TOM.

The Proposed Telegraph Organization.

TO THE EDITOR OF THE TELEGRAPHER.

OF course, I am pleased with the attention given my suggestion in a late issue to your correspondents. Those with whom I have spoken favor it strongly, and the more I considered it the better I think it myself. New York City, being the great centre in every respect, the movement should be inaugurated there, as a more successful start can likely be made, because more talent, interested in the welfare of the profession, is necessarily congregated there.

The gentlemen who must first consider and originate a plan of organization will have many questions to consider in connection therewith, and I would be glad if your correspondents would freely make such suggestions as occur to them.

Should the association have something of the character of Free Masonry, as regards secrecy? It may be thought best to have passwords, signs and lectures, in order to prevent impositions, as has been suggested by the loan of a certificate.

How many degrees shall we have? I think two is enough. Three would certainly answer. Shall the degrees be known by numbers, or shall they have names indicating the advancement made by the possessor? What shall be the title of the officers necessary?

PERKINS.

Electric Protection for Express Cars on Railroads.

CHILLICOTHE, O., June 1.

TO THE EDITOR OF THE TELEGRAPHER.

ROBBING express messengers upon railroads while trains are in motion has become a matter of frequent occurrence, and a greater safeguard for valuables and the lives of employes seem to be demanded. It is not a difficult matter for two or three armed ruffians to step upon the forward end of an express car in the night, and, after the train has gained a rapid speed, burst in the door and commence a murderous attack upon the express messenger before he can summon assistance. I would suggest that an electric bell be placed in the baggage or postal car of every express train, with wires leading to the express car, and by a simple contrivance no door could be opened from the outside without ringing the bell, or, by a touch, the messenger could ring the bell himself. The doors could be opened from the inside without ringing the bell. By this arrangement it would be impossible for any one to gain admittance to the car without sounding a signal in the baggage or postal cars, thus summoning assistance instantly. It would not cost over twenty-five dollars to equip a car with such signals, and the annual maintenance would not exceed five dollars. Perhaps there are cars so equipped now; if so, I have not heard of it.

I. N. MILLER.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended May 12, 1874, and bearing that date.

150,846.—TELEGRAPH RELAY.—Thomas A. Edison, Newark, N. J. Application filed June 27, 1873.

Current of a small opposing local battery thrown through relay. A rheostat in its circuit enables it to be adjusted to first neutralize any current due to leaks.

1. The magnets *d* and *e*, arranged to operate at opposite sides of the armature lever *f*, in combination with the battery *k*, circuit 3, rheostat *l*, key *b* and connections 2 thereto from the main line *c* and the circuit 3, as set forth.

2. An electro-magnet connected in a circuit with a battery at both stations, combined with a rheostat and counter current, to neutralize the effect in the magnet of a current arising from leakages in the line, substantially as specified.

Born.

KING.—June 1st, 1874. To Mr. Charles C. King, of the Albany, N. Y. Western Union Office, a son.

Died.

DOLAN.—In this city, May 27th, of consumption, DENNIS DOLAN, line repairer of the Gold and Stock Telegraph Company.

EAGAN.—WILLIAM EAGAN, an operator in the Western Union Office, 145 Broadway, New York, died in this city, Saturday, May 30, of Bright's disease of the kidneys.

ANNETT.—At Cheyenne, Wyoming, May 26, 1874, LOUIS JAMES, son of C. F. ANNETT, aged one year and eight months.

Obituary.

WILLIAM EAGAN.

In the death of Mr. WILLIAM EAGAN, who expired on Saturday morning last, at his home, 42d street, in this city, the Company loses a faithful employe, and his associates mourn the loss of a friend and genial companion. He had been confined to the house but a few days, having been at the office as late as the Tuesday preceding his death. He had, however, been suffering for some time from Bright's disease of the kidneys, which ultimately caused his death. He was a young man of twenty-three or twenty-four years of age, quiet and unobtrusive in his ways, and leaves many friends among his late associates who mourn his early demise.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JUNE 6, 1874.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

The Farce Played Out.

THE first session of the Forty-third Congress is nearly concluded, and, as will be seen from our Washington letter, the House Committee on Appropriations have closed the hearings on the Government telegraph schemes. It is not expected that the Committee will make any report at the present session on the subject, for, even if they did, there could be no time for consideration of the subject, much less for any action upon it.

The matter has degenerated into something very like a farce, and it would be allowed to subside entirely but for the persistency of one man, who seems determined to keep up the agitation of the subject, although it has been evident for some time past that there is not the slightest probability of his accomplishing anything that even looks like success. We allude, of course, to Mr. GARDNER HUBBARD, who, session after session and year after year, appears at Washington with his postal telegraph project, so called, and, with the aid of Senator RAMSAY, Chairman of the Senate Committee on Post-offices and Post-roads, keeps telegraph companies stirred up and puts them to the trouble, annoyance and expense of opposing his plan for confiscating their property for the benefit of himself and those whom he sees fit to associate with him for the purpose.

It is an absurdity to call Mr. HUBBARD's scheme a Government or Postal Telegraph project. An examination of the bill, which has been several times reported in the Senate by Mr. RAMSAY, will show that the Government has little interest in the matter in case his bill should become a law, further than to provide the major part of the facilities for doing the business, and defraying a good share of the expense; the profit, if any, inuring to the corporators for whose benefit a telegraphic monopoly is proposed to be established. Of course, there is not the slightest probability that any such one sided arrangement will receive Congressional endorsement and legislation; but, nevertheless, the telegraph interests are obliged at great expense and trouble to be constantly defended, lest it should appear that they are indifferent, and thus some show of plausibility be given to Mr. HUBBARD's pretensions.

What little of popular support these Government telegraph projects may have had at one time has long

since been withdrawn from them, as the people have in the discussion become better informed in regard to the facts and the principles in regard to the subject. It has been realized that a postal telegraph, properly so called, means that the telegraph lines shall be conducted and managed by Government officials at the expense of the Treasury for the benefit of the few. The plan of Mr. HUBBARD, who, so far as we understand, does not even claim to be in favor of an actual Government ownership of the lines, is even more objectionable than this. He proposes to have established by law a telegraphic monopoly in the hands of himself and friends, in which the Government shall be partners to the extent of sharing the cost, while they pocket the proceeds.

It cannot be denied that Mr. HUBBARD has greatly injured the telegraph interests of the country, and more especially those engaged in competing with the Western Union Company. It has even been charged that he was really working in the interests of that company, and that the apparent contest between them was all a sham, and that an understanding actually existed between him and the managers of the Western Union Company that he should pursue the course he has and does. We do not believe that such is the case, however, because, while in some respects his course may aid the plans of the Western Union Company, it at the same time is injurious and annoying to it.

The honesty of Mr. HUBBARD's pretensions, that in this matter he is actuated by a regard for the interests of the people, may well be called in question, from the fact that he combines with his telegraph projects a general lobbying business at Washington, adverse to the interests of the Government. He is the paid lobbyist of the Bank Note Engraving Companies in their opposition to the engraving and printing of the currency being done by Government officials and employes and in the Treasury Department. He is also engaged in other lobby schemes, and doubtless finds his profit in them. We mention these facts to dissipate the idea that some have entertained that in his persistent telegraphic lobbying he was actuated by the regard for public interests which he has claimed.

We perhaps owe our readers an apology for occupying so much space in treating of this matter, which has, we doubt not, become as wearisome to them as to us, but it is one in which we are all interested; and the only hope which Mr. HUBBARD and those engaged with him can have of success is in tiring out the telegraph interests and the public, and in some unguarded moment obtaining legislative action which shall in some way commit Congress to his plan. An attempt of this kind was made, we think, at the last session of the Senate, to secure the passage of the HUBBARD bill in the Senate on a Saturday, when but few members were present, and had it not been for the opposition of Senator CONKLING of this State it might have been successful. It will be seen, therefore, that however wearisome and disagreeable the subject may be, it is necessary that it should be kept before the public, and we know of none in which practical telegraphers have a deeper interest. We hope, however, that it may not be necessary to trouble our readers with it again for some time to come, as the farce is about played out, so far as this Congress is concerned.

In conclusion, we will merely repeat what we have before said, that, as between the HUBBARD scheme and a Government telegraph proper, we think the latter decidedly the most preferable; but we are confident that no more injurious and damaging action could be possible for telegraph employes, the public, and telegraph interests, than for the Government to acquire the ownership, management and control of the telegraphs of this country.

The Western Union Dividend.

THE long anticipated and much talked of dividend on the shares of the Western Union Telegraph Company was declared on Wednesday last, and it is believed that regular dividends will hereafter be paid

to the stockholders. This is a gratifying evidence of the prosperity of the telegraph interests.

The immediate effect of the declaration of this dividend was a decline of about one per cent. in the market price of the stock, as a larger dividend had been anticipated; but this was subsequently recovered when the report to the directors (which is published elsewhere) was generally made known.

Telegraphic Science in India.

THE more scientific portion of our readers will find much to interest them in the valuable article by Mr. AYRTON on the telegraph system of India, which we reprint from the *Journal of the Society of Telegraph Engineers*, and the first instalment of which will be found in the present number of THE TELEGRAPHER. Ten years ago the telegraphic system of India was probably about the worst and most inefficient in the world. Its management was literally a byword and a reproach. It is a fact that at one time the officials actually issued a circular to the public requesting them not to send any messages during the rainy season, except such as were absolutely necessary! Again, in his official report for 1860, the Government electrician set forth the remarkable theory that insulation could be altogether dispensed with, for the reason that "distilled water, which rain chemically is, is a capital insulator of voltaic currents."

But within a few years a most extraordinary improvement, amounting almost to a revolution, has been brought about mainly through the efforts of Col. ROBINSON, R. E., now Director-General of telegraphs for India; and it is probable that at the present day there is not a telegraphic system in the world that is operated on more thoroughly scientific principles than that of India. The methods of testing and measurements are described by Mr. AYRTON in a concise and clear manner, and some of the regulations, especially the provisions for testing by rule when all the wires are interrupted, might be introduced in some parts of our own country, where the conditions are similar, with great advantage. It is also of interest to know that, although their ideas and methods of working are essentially English, yet they have introduced the American sounder and the American method of operating by sound almost universally, and seem to be strongly prejudiced in its favor, as might be expected from people who have tried it. We commend this and the succeeding portion of Mr. AYRTON's article to the careful attention of our American telegraphers, assuring them that they will find much of value and interest therein.

The New Atlantic Cable.

THE new cable steamship Faraday, which was built for the SIEMENS BROTHERS specially for the work in which she is engaged, has arrived upon our coast, and before these lines are read will probably have commenced laying the cable of the United States Direct Cable Company from Rye Beach, N. H., which is to be the western terminus. The Faraday has on board the cable required for that portion of the line from Rye Beach to Tor Bay, Nova Scotia, where it is to be landed, and from thence to the coast of Newfoundland, where the eastern end will be buoyed, and the Faraday return to England for the balance of the cable. Her second trip will be from the landing place on the Irish coast to the Newfoundland coast, where the two ends of the cable will be spliced, and, if no mishap occurs, the line will be in readiness to commence business. It will not, for the present at least, be landed in Newfoundland, for reasons which we have already explained.

In a few weeks, therefore, we may reasonably expect that a competing ocean telegraph line, connecting the United States and Europe, will be in operation, and the enterprising and persevering promoters of this cable have the best wishes of THE TELEGRAPHER for their practical and pecuniary success. The length of the circuit to be worked will, there is reason to fear, inter-

fare somewhat with the speed of transmission over it, but the company may perhaps have means for overcoming this. If successful in the competition with the Anglo-American Company, this cable will be the precursor of others to be laid hereafter.

It will doubtless be of advantage to the telegraph companies in this country to have an independent cable telegraph line with which to connect, and the result may be the building up of a united competing system in this country, which shall prove formidable to the Western Union Company. If it shall have this effect the future of the telegraphs not connected with the Western Union combination will be more encouraging than their past has been.

Defective Postal Arrangements.

WE are informed that some of the subscribers to THE TELEGRAPHER, especially west of the Rocky Mountains, are troubled by irregularity in the receipt of their papers. This arises in part, no doubt, by defective postal arrangements. Great care is exercised in forwarding the papers regularly from this office. Probably three quarters of our weekly edition goes through the Post-office. These are almost invariably deposited in the New York Post-office Friday afternoon, there having been not more than two or three exceptions to this in the last three years. There used to be delay and sometimes failure in this Post office, but under Postmaster JAMES the New York is one of the most admirably managed offices in the country, and all mail matter is promptly forwarded. The trouble consequently must be either in the Post-offices to which the papers are sent or on the route. Subscribers who fail to get their papers regularly and promptly should call the attention of their local postmasters to the matter and have an investigation made into it. They may rely upon it that the papers are regularly mailed here, and promptly forwarded from the New York Post-office.

A New Telegraphic Establishment.

As will be seen by their advertisement, Messrs. PATRICK, BUNNELL & Co., of Philadelphia, have established a branch of their house at No. 22 Dey street, in this city. They do not propose to abandon their quarters, which they have so long occupied, at No. 38 South Fourth street, Philadelphia, or diminish in any way their former facilities in that city, but seek by this movement to increase and extend their business. They have been very successful, and the instruments and apparatus manufactured by them have a deservedly excellent reputation, every attention being bestowed to make them in every respect creditable to themselves and satisfactory to their customers. As practical telegraphers they know what is required, and as business men they realize the importance of good workmanship and materials in the manufacture of their goods.

Personals.

Mr. A. H. BABB has accepted a position with the A. and P. and Franklin Companies, at 198 Broadway, New York.

Mr. M. G. CHIPMAN, formerly of No. 145 Broadway, but more recently with the Franklin Company, at Waterbury, Conn., has accepted a position with the A. and P. and Franklin Companies, at No. 198 Broadway, New York.

Mr. P. J. TIERNEY, formerly of No. 145 Broadway, has resigned his position with the Western Union Co., in Omaha, and takes a position soon in Chicago.

Mr. HORATIO N. WILLIAMS has resigned his position at Providence, R. I., on account of ill health, which has caused his absence from the office since last November. Mr. WILLIAMS is one of the oldest operators in the country, having been identified with the first line of telegraph which penetrated New England. He was afterwards manager of the American Company's office at Worcester, Mass., a position held by him for many years. After this he returned to Providence, as manager of the Independent. Relinquishing that position he became assistant manager of the American office in the same city. His failing health compelled him, a few years later, to exchange the onerous duties

of that position for another with the C. N. D., which, also, he now gives up. Mr. WILLIAMS has many friends all over the country, and he will be well remembered by the old timers, all of whom will regret to learn of the misfortunes that have overtaken him.

The office of the Western Union Telegraph Company at Lake George, N. Y., was opened for the season June 1st, and Mr. C. E. ARNOLD, of the Albany (N. Y.) office of that company, who had charge of the office last summer, has again been appointed manager and operator.

Miss CLARA HAINING, telegraph operator for the Great Western Railroad, at Paisley Station, Bruce Co., Ontario, Canada, is visiting her friends at Hoboken, N. J., on a month's leave of absence.

Mr. J. F. McAULIFF takes the position in the Albany, N. Y., Western Union, vacated by the transfer of Mr. C. E. ARNOLD to the office of that company at Fort William Henry Hotel, Lake George, N. Y.

Mr. JAMES D. WHITE, of the Western Union Telegraph Company, at Bay City, Mich., has accepted the position of report operator, Jackson, Mich., office of the same company.

The Telegraph.

Resumption of Dividends by the Western Union Telegraph Company.

A MEETING of the directors of the Western Union Telegraph Company was held at the Executive offices of the company at noon on Wednesday, June 3, at which President Orton presided, and presented the following report, which was accepted and adopted, together with the annexed resolutions:

To the Directors.
The net profits of the company for the eight years commencing July 1st, 1866, and ending June 30th, 1874—those for the present month of June being estimated—are \$23,077,069.23.

Of this sum there has been distributed in dividends to stockholders..... \$4,857,239 34
Disbursed for interest on the Company's bonds... 2,530,749 98

\$7,387,989 32	
The balance, \$15,689,079 91, is represented as follows:	
Paid for the construction of new lines and the erection of additional wires.....	\$4,920,868 53
Paid for the stock of companies leased to the Western Union, subject to an annual rental.....	700,299 95
Western Union stock (72,877 shares).....	4,054,483 07
Gold and Stock Telegraph Company's stock (47,710 shares).....	1,173,509 00
Internat'l Ocean Telegraph stock (10,384 shares)	961,556 42
Pacific & Atlantic Telegraph stock (56,636 shares).....	597,585 50
Anglo-American Telegraph stock (£1,308).....	10,000 00
Western Electric Manufacturing Company's stock (500 shares).....	39,000 00
Western Union bonds redeemed and cancelled.....	1,068,575 00
Western Union building, Broadway and Dey street, mortgage sinking fund.....	60,000 00
Real estate, exclusive of Broadway and Dey street property.....	328,769 86
Patents (the Page and Duplex Telegraph).....	61,758 00
Cable steamer.....	12,665 19
Western Union bonds not cancelled (\$7,500).....	6,750 00
Fraction of share, old issue, redeemed and cancelled.....	42 50

Total..... \$13,990,863 02
Leaving a balance of net profits..... \$1,698,216 89

Represented as follows:

Cash on hand and due from agents.....	475,000 00
Call loans.....	400,000 00
Advanced on account of the new building, Broadway and Dey street, in excess of the building mortgage bonds.....	300,000 00
Poles, wire and other materials, and other supplies on hand.....	423,216 89

Of this sum, \$1,400,00 is the net profit for the six months ending June 30th, instant—about \$740,000 being the net profit of April, May and June. This is an increase of more than \$250,000 over the net profits of the same three months last year (1873). In view of the large reduction in rates throughout the South and West, which took effect on the 1st of July, 1873, and of the universal depression in most kinds of business which followed the financial panic of September last, such a result is most gratifying, and seems to furnish grounds for the belief that, as the general business of the country improves, the receipts and profits of the company will continue to increase. The Executive Committee have had under consideration for some time past the subject of a disposition of the unappropriated profits above stated. They were at first inclined to recommend a dividend equal to the net earnings of the current six months, which would be about 4 per cent. on the capital outstanding. To do this, however, would necessitate either the funding of the amounts expended for construction and on the new building, in excess of the loan made for that purpose, or the sale of a portion of the company's stock now in the treasury. On mature deliberation it is deemed advisable to do neither, but to limit the dividend to the profits of the current quarter. This course they have unanimously advised

me to recommend to the Board, and, in pursuance, I submit the following resolutions:

Whereas, The business and financial condition of the company justify the resumption of regular dividends to the stockholders, which, in the judgment of this Board, should be made quarterly; therefore,

Resolved, That a dividend of two per cent. from the net earnings of the three months ending June 30 be, and the same is hereby declared payable on the 15th day of July next.

Resolved, That for the purpose of such dividend the stock books be closed at the close of business on the 25th instant, and be opened on the morning of the 16th of July.

WM. ORTON.

The New Atlantic Cable.

The steamship Faraday, with that portion of the cable of the United States Direct Cable Company to be laid between Rye Beach, N. H., and the coast of Newfoundland, arrived at Berryhead, Nova Scotia, on Saturday last, May 30. She landed the shore end of the cable Sunday morning, and proceeded to Rye Beach Sunday afternoon.

Berryhead is the southwest side or point at the entrance to Tor Bay.

Foreign Telegraphic Notes.

Messrs. GRANT BROTHERS & Co., of London, have announced that the half yearly coupons, due the first of May, on the seven per cent. first mortgage building bonds of the Western Union Telegraph Company, will be cashed at the fixed exchange of 4s. per dollar—equal to £7 per coupon.

The traffic receipts of the Eastern Extension, Australian and China Telegraph Company, for the month of April, 1874, amounted to £16,670, against £18,333 for the corresponding period of 1873.

The number of messages (of twenty words) passing over the line of the Barcelona-Marseilles cable for the month ending April 30, 1874, was 4,064.

The Eastern Telegraph Company announces the opening for traffic of its new cable between Italy and Egypt via Zante and Candia. This company has now three cables working efficiently between Europe and Egypt, which is thus placed in direct submarine telegraphic communication with Great Britain, Spain, Portugal, Gibraltar, France, Malta, Italy, Greece and Turkey.

The German Union Telegraph Company have declared a dividend, for the year 1873, of £1, 1s. 2d. per share of £15.

The Hamburg-Heligoland Telegraph Company have declared a dividend at the rate of 8s. 11d. per share, of 100 thalers or £15.

The total number of messages forwarded from postal telegraph stations in the United Kingdom, for the week ended May 9, 1874, was 375,870—an increase of 46,488 on the corresponding week of the previous year.

The administration of the Russian Telegraph Department has just issued a new code of regulations with reference to the employment of females in the service, according to which 30 per cent. of the appointments may be filled by women and girls, whose salaries commence at 300 roubles, rising annually to the maximum of 600 roubles. The latter sum is at present paid only in the Amoor provinces, whilst in the offices of Russia in Europe the pay ranges between 300 and 420 roubles. Extra gratifications are now promised to those female telegraphists who are able to translate English messages; and can operate with the apparatus on Hughes's system.

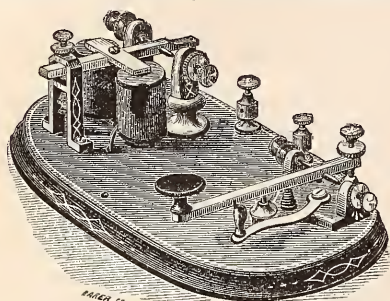
It is reported that the German Reichstag are about to introduce a newly invented apparatus for taking the votes by electricity. Even with the aid of this invention it will not be possible for them to vote in a more shocking manner than our own Congress has on some recent occasions.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
MAY.			
28	72½ ... 73½	17% ... 18	.....
29	72% ... 73%	.....	.....
30	.....	.....	.....
JUNE.			
1	72% ... 73%	.....	.....
2	71½ ... 72%	.....	.....
3	71% ... 73	.....	..... 52

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
Chicago, Ill.
PRIVATE LINE INSTRUMENTS.

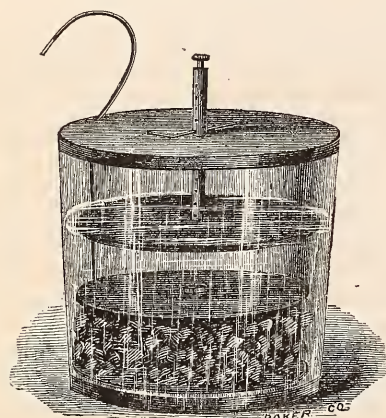


Price, - - - - - \$10.00.

This Instrument is well finished, and gives a clear, loud sound. It is made to work on a line from a few feet to ten miles in length. Give length of line in order in Instrum-nt. One cup of BLISS RESERVOIR BATTERY is furnished with each Instrument.

GEO. H. BLISS & CO.,
CHICAGO, ILL.

BLISS RESERVOIR BATTERY.
PATENT APPLIED FOR.

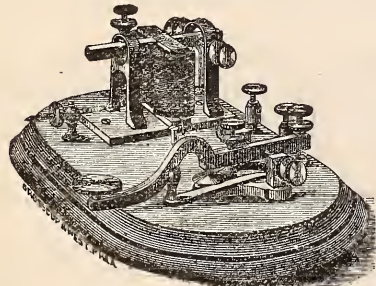


Price per Cell, - - - - - \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
Chicago, Ill.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,
WAVERLY HEIGHTS, PENNSYLVANIA.
PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

- 1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50
If money be sent in advance by registered letter 12 00
Instruments without Battery 11 50
Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

SEND FOR CIRCULAR.

ANNOUNCEMENT!

Messrs. **PARTRICK, BUNNELL & CO.** hereby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

- AT -
22 DEY STREET, NEW YORK,

where they will keep in stock all styles of First Class Late-t Improved

MORSE TELEGRAPH INSTRUMENTS, SUPERIOR QUALITIES OF BATTERY MATERIAL AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

- The stock will include all our celebrated specialties in
- CHAMPION LEARNERS' INSTRUMENTS,
 - NEW GIANT SOUNDERS, PERFECTED,
 - IMPROVED CURVED KEYS,
 - ELECTRIC BELLS, IN GREAT VARIETY,
 - NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED LIGHTNING ARRESTERS,
 - LATEST AND BEST FORMS OF GRAVITY BATTERIES.
- Together with **LINE WIRE,**
- OFFICE WIRE, BRACKETS,
 - INSULATORS, LINE TOOLS, Etc.

Send for Catalogue and Price List.

PARTRICK, BUNNELL & CO.,
22 DEY STREET, NEW YORK.
38 South Fourth Street, Philadelphia.

GOOD NEWS FOR TELEGRAPH STUDENTS.

An Instrument has been invented, which is now offered for sale—prices within the reach of all—enabling both young and old to become proficient at a minimum expense. The beauty and finish delights all. The sound is perfect, and only needs an inspection to assure the idea of perfection of the invention.

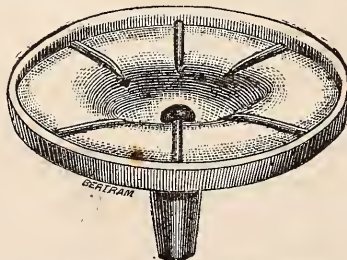
- No. 1. Instrument, with Alphabet. 25 cents.
- " 2. " " " 50 "
- " 3. " " " rubber knobs. 75 "

A LIBERAL DISCOUNT TO AGENTS.

Send for Sample and Prices.

ADDRESS, **G. A. WESSMANN,**
544 Nostrand Avenue,
BROOKLYN, N. Y.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."
The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They *thoroughly insulate the Battery*, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraphic and electrical supplies on hand.

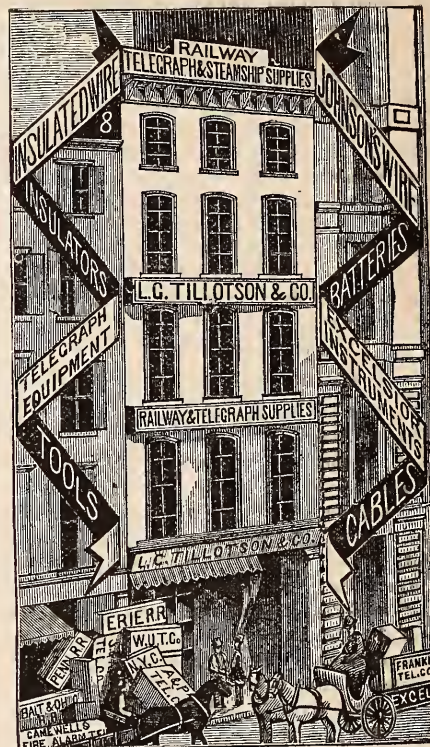
WATTS & CO., Baltimore, Md.

Send for catalogue.

HARD PAN DISCOVERED!

L. G. TILLOTSON & CO.,
8 DEY STREET, N. Y.,

are offering 20 per cent. discount from list prices on all Telegraph Instruments of their manufacture.



BUY THE BEST.

IF YOU WANT
EQUIPMENT

FOR A
TELEGRAPH LINE,
ORDER OF

L. G. TILLOTSON & CO

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST,**
and **QUALITY** THE BEST.

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their OWN EXPENSE.

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest success of the times.

L. G. TILLOTSON & CO.,
8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all Instruments of our manufacture.

L. G. TILLOTSON & CO.,
8 Dey Street, N. Y.

THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinhilf, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

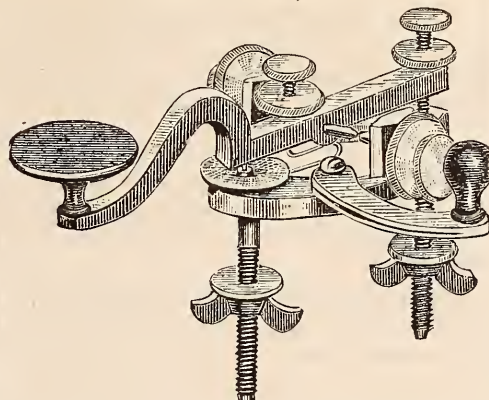
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out.

Acknowledged to be a decided improvement. Price, same as the ordinary key.

Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

- "BEST" GALVANIZED WIRE,
- OAK OR LOCUST SCREW PINS AND BRACKETS,
- CROSS ARMS,
- BROOKS' OR GLASS INSULATORS,
- SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

THE "SNAPPER" SOUNDER.



SPECIAL NOTICE.

All orders dated on and after June 1st will be filled with the new style, polished, "Snapper," at the original price of 30 cents, or 6 for \$1.50.

A few of the old style will be closed out at 25 cts, or 6 for \$1.25.

R. W. POPE,

P. O. Box 5278, New York.

New York, May 30, 1874.

THE "SNAPPER" SOUNDER.



NEW STYLES, NEW PRICES.

The unexpected and growing demand for the original "Snapper" Sounder, beyond the expectations of the manufacturers, has delayed the introduction of proposed styles and improvements.

Having increased our facilities and accumulated sufficient stock to enable us to fill orders promptly, the following varieties are now offered for sale at prices which will accommodate all classes.

- The "Snapper" Sounder, plain.....30c. 6 for \$1.50.
- " " " nickel plated spring... 0.40.
- " " " or 6 for..... 1.80.

A few were manufactured to order with hard rubber knobs. They were so well liked that I have decided to introduce them to the fraternity. The springs are secured by two screws, and should they break, may be replaced at an expense of 15 cents. They are thoroughly made and finished.

PRICE,  75 CENTS.

To the Dominion 5 cents each extra.

A liberal discount to agents.

R. W. POPE,

Box 5278, New York.

F. L. POPE & CO., 38 Vesey Street,

Agents for New York City.

SMITH & HALL,

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Agents for Canada

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
- RELAY, SOUNDER and KEY on same base, making an elegant set.
- WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
- HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR

- KIDDER'S MEDICAL APPARATUS,
- JONES' LOCK SWITCH BOARDS,
- HILL'S ANNUNCIATOR and FIRE ALARM,
- PUTT'S MECHANICAL INSTRUMENTS,
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AGENTS FOR

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- KERITE and GUTTA PERCHA WIRES and CABLES.

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AGENTS FOR

- WASHBURN & MOEN'S celebrated GALVANIZED WIRE; also, AMERICAN COMPOUND WIRE.

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- BROOKS' INSULATORS,
- KENOSHA INSULATORS,
- SCREW GLASS INSULATORS,
- TELEGRAPH POLES,
- BRASS ECCENTRICS,
- HAND VICES,
- STEEL CLIMBERS,
- STUBBS and PATENT PLIERS.
- VAUGHAN'S AUGURS and TOOLS in variety.
- SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.
- TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.
- SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.

Bliss' Manual and Price List furnished free on application.

GEO. H. BLISS & CO.,

41 THIRD AVE.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

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Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

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ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs-

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

QUICK SALES, SMALL PROFITS AND SUPERIOR GOODS.

We are offering any of our unequalled Telegraph Instruments at 20 per cent. discount from list prices.

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AND EVERY DESCRIPTION OF

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

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a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

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KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

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 AND AGENCY FOR THE SALE OF
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 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
 ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be produced in less time and at about half the cost of those manufactured in this country.

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STEEL FOR STRENGTH.

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 Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
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 And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.
 Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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 It has already been extensively adopted and has invariably given entire satisfaction.

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of all kinds,
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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

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 For Amateurs and Learners, and Short Lines.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

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Sole Agents for the
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The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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POPULAR, EXCELLENT and ECONOMICAL.
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For AMATEURS, STUDENTS and SHORT LINES.

Since the introduction of this *Pioneer Low Priced Telegraph Instrument*, a little over a year and a half since, *nearly 2,000* have been sold, and they are constantly more and more sought after.

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 Two sets of Instruments, etc..... 12 00

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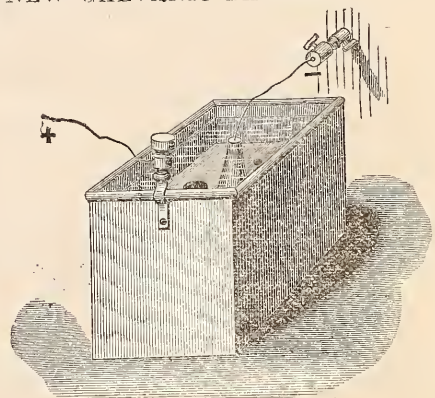
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A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

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PATENT APPLIED FOR.
 The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.
 No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.
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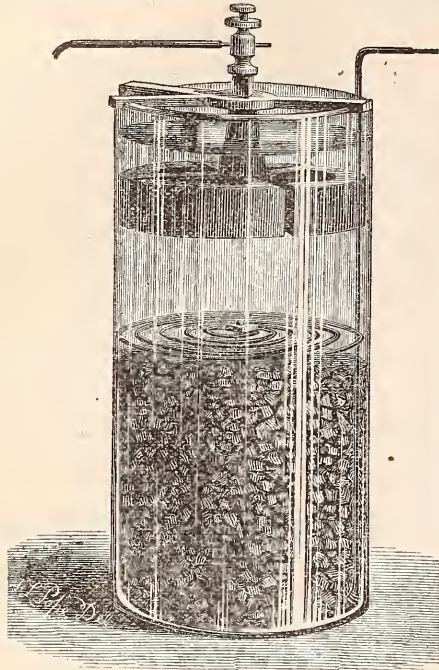
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we will contribute to the good work, by offering our Superior Telegraph Instruments at 20 per cent. below list prices. Quality will be strictly maintained.

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CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,

PATENTED APRIL 8, 1873,

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No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY

AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is ABSOLUTELY UNIFORM at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO.

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SOLE AGENTS.

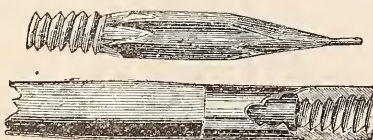
NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

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"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
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Each additional word 1c.		Each add. word, 2 to 3 cents.	
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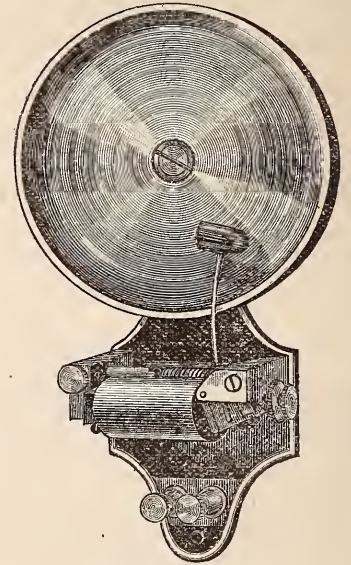
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One half of actual size

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The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard. Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight.. \$50 00

Sounders, from..... 4 50 to \$6 50

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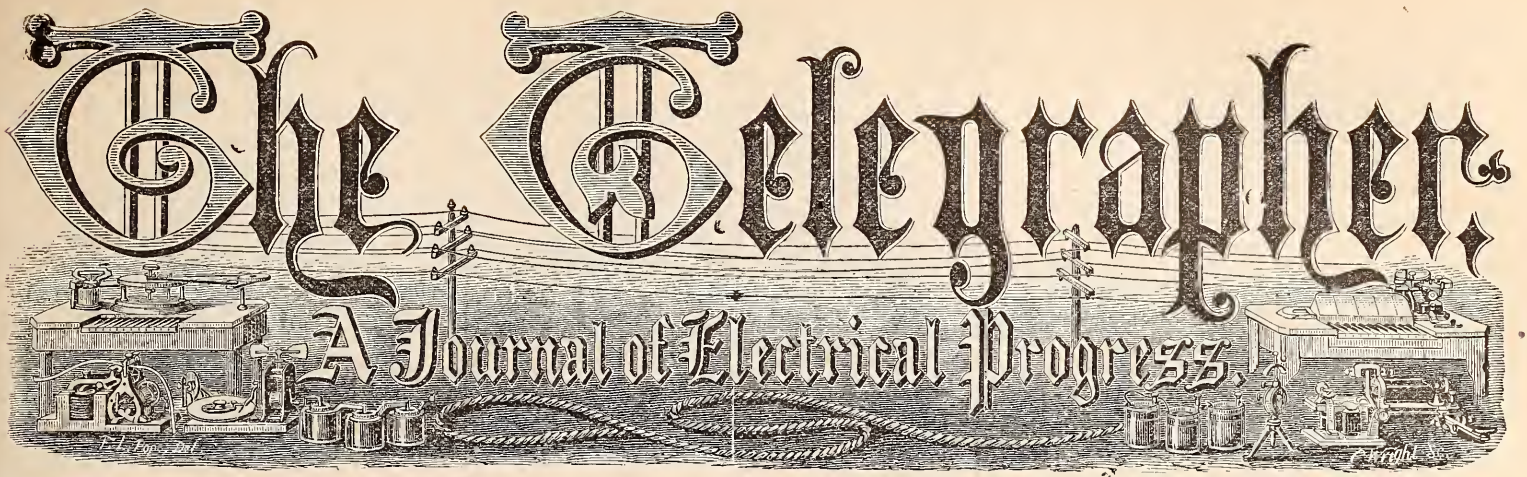
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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, June 13, 1874. Whole No. 413

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MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
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CHARLES WILLIAMS, JR.,
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FIRST CLASS TELEGRAPH INSTRUMENTS
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PATENT INSULATED TELEGRAPH WIRES,
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PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires
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We are also prepared to furnish a new style of
ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.

The American District and Gold and Stock Telegraph Com-
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Sample Card and Price List furnished when requested.
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General Superintendent's Office,
AMERICAN DISTRICT TELEGRAPH CO.,
NEW YORK, January 1st, 1874.

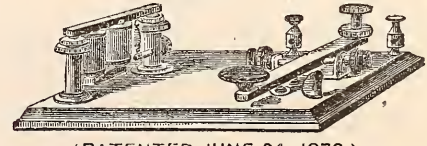
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Dear Sir: Your office wire is a decided success. We have
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market.
Respectfully,
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We warrant all Wire to be of the highest conductivity, tested
by our Galvanometer, which compares with the tests of the
highest authority in this country.

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and buy your Instruments at 20 per cent. discount from list
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TILLOTSON'S EXCELSIOR
TELEGRAPH INSTRUMENT.



(PATENTED JUNE 24, 1873.)
This apparatus is constructed of the best material, and finished
equal to any Telegraph Instrument, and is warranted first class
in every particular. It is especially adapted to the require-
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Price, complete, Sounder and Key mounted on finely
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Battery, with Chemicals, eight feet of Office Wire, and
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Two sets..... 14 50
Price of Sounder and Key only..... 6 50
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Late First Assistant Examiner of
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MANUFACTURERS OF
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We make the manufacture of Electric Wire a specialty—
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the same in every instance to be superior to that of any other
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ALEXANDER L. HAYES,
 Late Assistant Examiner of Electrical and Telegraphic Apparatus,
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SOLICITOR OF PATENTS,
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PATENT APPLIED FOR.

The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.

Price.....30 cents each.
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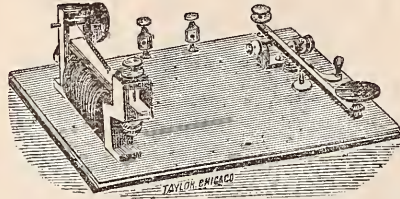
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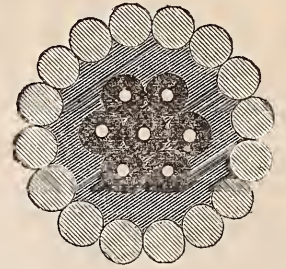
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THE TELEGRAPHER

A JOURNAL OF ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JUNE 13, 1874.

VOL. X. WHOLE No. 413.

Original Articles.

Telegraph Gossip.

If my experience is worth anything in regard to cheap telegraph rates as a means of putting telegraphy within the reach of the poorer classes, I certainly believe it will fail in its purpose.

The manner some persons assume when writing a telegram is often amusing. For instance, if Miss Jennie wants to send a familiar message to her sweetheart, it is quite perceptible in the expression of her face how dear he is to her.

One of the meanest tricks played upon me was done by a shabby young man who, with quite a business like air, asked me to change a five dollar note for Gen. Tweed, whose office at that time was in my vicinity.

Every operator knows how little the real sense of a message impresses him while taking it from the sounder. You don't "sense" it, as the old folks say.

(From The Ghost of Telegraphica.)

Jottings Here and There.

Mr. GEORGE C. WEBB, from Oswego, N. Y., succeeds Mr. W. H. Hargrave on the regular night force at No. 145 Broadway, New York.

Mr. D. W. McAneeny is with the night force for a week or two in place of Mr. Sawyer, in addition to working his own trick on the day force.

Master John H. Young, a graduate from the force of office boys at No. 145 Broadway, succeeds Mr. Cunningham, on the 15th instant, as operator at the Bay State House, Worcester, Mass.

A package of newspapers addressed as below were mailed at the New York post-office the other day, but the sender received notice that the postage with the appended superscription would amount to seventy-two cents.

I sent another, just like this, about a month ago, and some mail bag man went through it—which one I do not know.

Mr. William H. Hargrave, one of the oldest men on the night force at No. 145 Broadway, has been transferred to the day force at his own earnest solicitation.

A friend, who has given The Ghost frequent assurance of his interest in its welfare, sends the following lines for insertion.

EXTRACT FROM THE WIRE DIARY AT "Z" OFFICE (16 Broad Street, New York.)

12 M.

The blazing hour of noon has come, And Montreal is "open."

'Tis a case of that peculiar kind Where you can't form an opinion; You cannot almost always tell About this New Dominion.

If "Bu's" Morse man's on "report" All efforts will be in vain; The bane of my existence is That man who works the BAIN.

This Burlington "report" excuse Gets run into the ground; But 'tis useless to sit chinning here—I'll send my biz "around."

12:37.

The wire trouble 's been removed Just as I've had my say. Again I bear my cross. There's "X," So Montreal 's "O. K."

R. G. S.

And this, I believe, comprises all the things worth knowing which the log book at present contains.

JOHN OAKUM.

[From the Journal of the Society of Telegraph Engineers.]

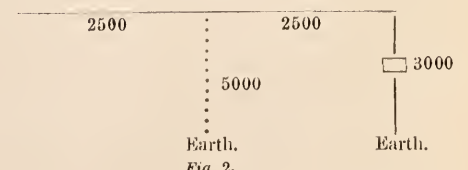
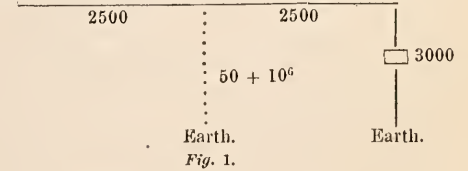
On some Points in Connection with the Indian Telegraphs.

BY W. E. AYRTON.

(Continued from page 134.)

Insulation.

ALTHOUGH testing for faults is of immense utility, the regular testing, which has now been carried on for about four years, under the Electrical Superintendent, Mr. Schwendler, has produced even more valuable results.



2500 + 50 + 10^6 (2500 + 3000) = 8000 nearly. 50 + 10^6 + 2500 + 3000

In the second case the current leaving the receiving station, if the same battery be employed, will be almost equal to—

$$2500 + \frac{2000(2500 + 3000)}{5000 + 2500 + 3000} = \frac{E}{5000} \text{ nearly.}$$

Therefore, with the bad insulators, the current leaving the sending station will be $\frac{2}{3}$ of what it would be if all the insulators were good. Consequently, the introduction of these bad insulators will increase the consumption of battery materials by about 60 per cent. Now let us consider the current arriving at the receiving station. When all the insulations are good this will be about equal to—

$$\frac{50 \times 10^6}{50 + 10^6 + 2500 + 3000} \times \frac{E}{8000} = \frac{E}{8000} \text{ nearly.}$$

In fact, scarcely any of the current will be lost en route in this case. When the one per cent. of bad insulators are introduced the current arriving at the receiving station will be about—

$$\frac{5000}{5000 + 2500 + 3000} \times \frac{E}{5000} = \frac{E}{10,000} \text{ nearly.}$$

Therefore the current arriving at the receiving station will, with the bad insulators, be about $\frac{1}{10}$ of what it would be if all the insulators were good. We may, therefore, say that, in the particular instance we have been considering, the introduction of this one per cent. of bad insulators increases the consumption of battery materials by 60 per cent., and diminishes the received or effective current by 20 per cent.

From some thousands of Robinson insulators that I have lately been testing at Messrs. Siemens, I find that the average resistance, after one minute's electrification of a good Schunberg porcelain, is about four million megohms, of a good Pinder Bourne porcelain about two million megohms, and of a good Defuisseaux porcelain about five hundred thousand megohms, the insulators being in all cases inverted in pure water, with water in both porcelain cups, but with the edges of the porcelain cups dry (artificially dried with hot irons, if necessary). We might, therefore, reasonably expect that a line composed of such insulators should have, in the dry, hot weather of India, a minimum insulation of 1,000 megohms per mile, if the insulators be not damaged. It will be seen, then, in the instance previously taken, a rather low resistance was taken for the good insulators, and the harm done by the insertion of bad insulators was not made greater than it really is. These results being fully appreciated by Col. Robinson, have induced him to establish at Calcutta, Bombay and Madras, regular arrangements for continuous insulator testing, and now no single insulator is used in India that has not been previously tested at one of these places in the following way: First, each finished insulator, as it arrives from Europe, is tested individually with a delicate Thomson's galvanometer, to see that the resistance of the insulator after one minute's electrification is not below a certain standard. Next, the insulators are joined together in hundreds and the average resistance found. The importance of testing insulators individually is only beginning to be fully appreciated.

The following plan has usually been adopted in Europe: An agreement is made between the buyer and contractor that each insulator is not to have less than a certain resistance. The insulators are only tested in hundreds; and if the hundred have more than one hundredth part of the specified resistance per insulator, they are all passed. If, therefore, 99 of them had a resistance much above contract, and one a resistance much below contract, still the hundred might have a joint resistance much above the hundredth part of the contract resistance per insulator, and the one with low resistance would not, therefore, be detected. The buyer may answer that he does not care about this; all he wants is a certain insulation per mile. Unfortunately, however, any insulator that has a resistance much below the rest will probably go on deteriorating, since the cause that originally diminished its resistance may probably go on increasing, until the insulation per mile fall much below what is required, although it may have been considerably above when the insulators were first put up on the line.

As far as has been ascertained at present it appears that the defects in these solitary insulators are produced by excessively minute cracks in the head of the porcelain, or the part that fits into the iron hood, and by an accumulation in these cracks of moisture which forms a connection between the stalk and hood. These minute cracks are certainly, in many cases, not produced by simple mechanical injury—such as insulators might receive in travelling, or when upon the line from excessive strain caused by the wire, since a considerable percentage of some porcelain insulator cups sent out to India, and to which neither hoods nor stalks had ever been fitted, were defective in the manner I have described, and had, individually, less than a megohm resistance.

If the solitary bad insulators be scattered at all uniformly over a line, the only way in which they then can be detected is by testing every insulator singly. Now, to carry a delicate galvanometer and a large battery from post to post for this purpose would be exceedingly in-

convenient. To avoid this Mr. Schwendler has devised a powerful magneto-electric arrangement, by which a rapid succession of reverse currents, sufficiently strong to be detected by the fingers, is sent through an insulator if it be very bad, or strong enough to be detected by the tongue (which is a cheap, and remarkably delicate galvanoscope), if the insulator be less bad, but having a resistance below a certain amount, depending, of course, upon the power of the electro-magnetic machine.

At about every twenty miles or so, in all lines, shackles are introduced, by which the line is electrically broken, communication being in ordinary cases established by two spirals of their wire soldered respectively to the line wire on each side of the shackles, and ending in eyes faced with platinum which are usually screwed together. By this arrangement a lineman can disconnect the line at about every twenty miles, and communicate in either direction. This was particularly necessary before the introduction of scientific testing, as it was by first endeavoring to communicate in one direction and then in the opposite that the man who had been sent out in case of interruption knew on which side of him the fault lay; and even now, when the faults are localized by testing, as their distance can only generally be found within one or two per cent., it is often of great use on a long line for the man to disconnect nearest to the spot localized, and see on which side of him the fault exists.

Earth Plates.

In Europe the ordinary way to make an "earth" is to use the iron gas, or water pipes, but in most places in India such pipes do not exist, so that some large piece of metal has to be buried for that purpose. A coil of iron wire, a piece of an iron post, or a copper plate have been used at different times. Now, as the nature of the ground in the immediate neighborhood of this buried piece of metal greatly affects its electrical utility, it becomes a question of great practical importance to determine in absolute units the resistance of the "earth" used in each particular case.

It might at first sight appear possible to obtain the resistance of the "earth" at a distant office by testing the resistances respectively of two lines put to earth at that office, and comparing the sum of the resistances so obtained with that of the loops. There are two reasons, however, why such a system would be extremely inaccurate: first, because, even if the lines were perfectly insulated, as the resistance of an "earth" is, or should be, exceedingly small compared with that of the line, the slightest possible error made in taking the circuit resistance would produce an enormous percentage of error in the calculation of the resistance of the "earth;" secondly, as the insulation of most lines is not generally very good, the resistance of the loop is frequently greater than the sum of the resistances of the two lines when put to earth at the distant station, so that, if the fact of leakage were not considered, the earth might be said to have a negative resistance.

The following method, suggested by Mr. Schwendler, and fully developed in a paper I read before the Asiatic Society at Bengal, is at present in use by the Indian Telegraph Department, and is open to none of these objections:

Select two other earths which are neither in metallic connection with one another, nor with the telegraph earth to be tested. Two iron telegraph posts near the office answer the purpose very well, only care must be taken that there is perfect metallic contact between the leading wire and the iron post in each case. In the dry season it would be advisable to pour water over the three "earth" used. Measure the resistance between each set of "earth," and in this way obtain three independent equations, containing the three resistances of the three "earth," and the known resistances of the three leading wires going respectively from each earth to the testing arrangement. From these three equations the required resistance can be found, and the question would be completely solved did the earth circuits behave as simple metallic circuits. This, however, is not the case, for, in the first place, an earth long used for telegraphic purposes frequently acquires a highly polarized state giving rise to a current; secondly, if the "earth" employed are not of the same material—for instance, if the one is an iron post and the other a copper plate—they will form with the ground a galvanic element giving rise to a current; and lastly, the testing current itself polarizes the "earth." Consequently, the measurement of the same set of earths, taken successively with positive and negative currents, will not agree, and they will differ from each other much, if the current due to the "earth" is considerable in comparison with the testing current itself. To obtain the real means in each case, it is, therefore, necessary to employ the same sort of equations as were used in the case of line testing; the formula, however, in this case being somewhat more complicated, since the resistance of the testing battery cannot now be neglected in comparison with the other resistances, as is usually done in ordinary line testing.

The "earth" in many cases having been shown by testing to have a somewhat high resistance, they are now all made as follows: a copper plate, four or five feet square, is buried at a convenient depth, and the connection with it made by a wire insulated from the ground. The object of insulating the wire is to prevent it from becoming highly polarized, as it would be were the greater portion of the current to escape from its comparatively small surface, since, of course, the chemical action produced at any surface is (other things being the same) proportional to the whole current escaping, divided by the area of surface.

(To be continued.)

A Quaint Conceit.

A CORRESPONDENT of *The Railway Gazette* furnishes to that paper very interesting extracts from the diary of a gentleman familiar with American and English railroads, relating his experiences and observations during a journey across the Peninsula of India and Bombay to Calcutta, in which occurs the following quaint conceit:

"The Government telegraph posts, etc., are very worthy of notice. They are uniform all over India. They are slightly coned wrought iron tubes, very light and strong. Every fifth post is guyed with wire rope. The sockets of the arms slide over the top, and are of wrought iron galvanized. The whole thing looks very neat and workmanlike, and is in strong contrast to the various clumsy posts of the railway companies.

"One cannot speak of telegraphs in India without mentioning the king crow. Whether the bird be really corvine or not, I do not know; but he looks like a very small, tender crow, with a very long, forked tail. What the king crow did before the introduction of telegraphs and railways is hard to say. I believe he did nothing, but was one of the 'unemployed forces of nature.' Generation after generation of king crows were laid, hatched, lived and died, without fulfilling their proper calling. But their day came at last; with the introduction of telegraphs and railways they are called upon to fill their 'sphere.' Their mission was evidently to sit on the wires and keep an eye on the railway. It is true that the kingfishers are also given to sit on the wires; but this, with them, is evidently an amusement. Every one knows that their 'sphere' is to catch fish; but with the king crows it is evidently a business, and their sole end and aim in life. Every span of wire has its king crow, and there they sit, nodding their heads at every passing train. If railway directors only took half as much interest in the line as the king crows do there would be a little less waste of money than there now is. In this land of megalomania it would not be hard to fancy that when a director dies his soul goes into a king crow, and that a retributive justice thus compels him to watch constantly the railway that during life he neglected."

A Pleasant Telegraph Location.—The Attack on Barrow's Creek, Australia, Telegraph Station.

A BRIEF account of the attack of the Australian savages in the Barrow's Creek Telegraphic Station, and the killing of Mr. Stapleton, the station master (an American), and of a lineman, was printed in the TELEGRAPHER for May 9th.

The following details of this occurrence have been forwarded to the Adelaide journals by Mr. Todd, Superintendent of Telegraphs: On the evening of Sunday, the 22d ult., the whole of the station party, consisting of Mr. Stapleton, the master, and seven others, including a civilized native boy, were outside the building, smoking. They were holding a conversation with a young black fellow whom they proposed sending up the line on horseback with one of the linemen, when they were suddenly attacked from the eastern corner of the station house by a large body of natives, who speared Mr. Stapleton. Being perfectly unarmed the assailed made immediately for their station, to which there is only one mode of ingress; but here they were repulsed by a shower of weapons, and Mr. Flint, the assistant operator, and police trooper Gason were both wounded. Finding their retreat fenced off, they ran around the building in the hopes that they would be followed. This ruse appears to have been successful, for, on making a second attempt to enter the gate, they found it unguarded, and they accordingly entered; but not before John Frank, one of the linemen, had been fatally wounded. The party, when inside of the building, which is secure as a fortress, immediately armed themselves, and three shots were fired through the window at a body of natives at a distance of twenty yards, and afterwards two rifle shots at a distance of 100 yards. Next day, at 7 A. M., the natives made their appearance all armed, and seemed meditating a second attack, and four rifle shots, reaching a distance of 500 yards, were fired to disperse them. The trooper reports that it is probable that one or two of the shots

took effect, as some of the natives were seen to fall, and he thinks there is no doubt that some of the natives were mortally wounded in the affray of Sunday evening. John Frank, the lineman, was speared in his right side, the weapon penetrating his heart and passing through the back in a downward direction. He died immediately after entering the kitchen. Mr. Stapleton, the station master, was also fatally injured. He was wounded in the left side, the size of the wound being reported to be about one inch broad and three inches deep. He also received a nasty injury in the left thigh. He died on Monday afternoon. Mr. Flint, the operator, was speared in the leg, and the wound penetrated to the bone, at a distance of seven inches below the hip. The black boy, who was saved by being dragged through the window, was wounded half an inch below the right collar bone. He also received a spear wound in the left side between his fourth and fifth ribs, and his right hand was badly torn. Mr. Flint, who telegraphs to Mr. Todd while in great pain upon his bed, hopes to be all right in a few days, and he believes the boy will also recover. It is stated that the object of the natives in making the attack was to obtain supplies of flour and mutton. The following description of the station, published some time ago by the *South Australian Register*, will prove interesting, and show to the friends of those interested that the building is specially erected for the purpose of defence:—"Barrow's Creek is the prettiest station on the overland line, but it is a perfect hotbed of hostility. The building, like that at Charlotte Waters and Alice Springs, is of stone, and forms three sides of a square, with high walls and a strong iron gate across the back. In front of the house there are four windows, well protected with iron bars; there are also loopholes all round the house, but no other openings to the outside. All the doors open into the yard, the house is roofed with iron, and when the gates are closed it is a perfect fortress, which could be successfully held by three or four resolute men against very great odds. There are six men all told at each of the interior stations, and sometimes the work is warm enough for them. The natives pull the wire down and cut away great quantities of it for the purpose of arming the points of their spears. They also smash the porcelain insulators and use the sharp edged pieces to serape their spear blades into shape."

Berthon's Collapsible Barge.

AMONG other scientific devices with which the Faraday is supplied, with the view of facilitating the laying of the Direct United States Cable, is a "collapsible" barge, the principle of which is the invention of the Rev. E. L. Berthon, a name already well known in nautical circles in connection with his "Perpetual Log." The principle was originally applied by Mr. Berthon to lifeboats, a number of which, it is stated, are in course of construction. The barge was built by Mr. E. P. Berthon, the son of the inventor, and is to be used in laying the shore ends of the cable, of which it will carry from twenty to thirty tons with a very light draught of water. The proportions of length to breadth in the barge are very unusual, being nearly two to one, the dimensions being: Length, 31 feet; width, 16 feet; and depth, 4 feet. Such, however, is its collapsibility, that, stowed away on the deck of the Faraday, it only measures 2 feet at its greatest width. The barge is cellular in construction, and when a small confining rope is cast off it expands automatically, inhaling into its ten cells about 500 cubic feet of air. During the process of expansion the jointed bottom boards, which are 14 feet wide, fall into their places, and lever stanchions being placed under the gunwales, the barge is ready for lowering in a minute or two. When in the water a very substantial platform is lowered into the barge, composed of beams 7½ inches thick and 1 inch planks. Upon this deck the cable will be coiled, and will be payed out over a large iron sheave at the stern post. The barge weighs about 25 cwt., and having great powers of flotation with light draught, is expected to be very serviceable in laying the shore ends of the new cable. The principle, moreover, appears to be one which it might be found desirable to introduce into the lifeboat service.—*London Times*.

West India and Panama Telegraph.

THIS company has, by purchasing up the concessions and rights of the Central American Company, not only removed a formidable rival from the field, but has secured a control of the traffic between North and South America for the next forty years, and between each of those grand divisions of the western continent and the Leeward Islands. In order to estimate what may be the extent of this traffic we have to look at the character of the trade of the several countries which will be accommodated by the company's lines and cables. Men are content to wait for ordinary gossip and friendly communications until they can be supplied to them by the ordinary post-office arrangements; but in the mar-

kets of the world there is an extraordinary amount of impatience, and hunger, and thirst after commercial information, and hence it is, that where there is much buying and selling of commodities, there the electric telegraph is kept in fullest play. Looking to Brazil, to the Plate Districts, to Chili, to Peru, and north of the Isthmus to the States of Central America, we find them producing in abundance all those articles of commerce—cotton, coffee, sugar, tobacco, peltry, breadstuffs, guano, &c.—about which the merchants of London, Liverpool, New York, Boston, Havre, and the other great commercial centres of the world chiefly busy themselves. Again, there is a vast amount of capital, both American and British, invested in remunerative public works in those countries, and in developing their mineral resources, and, as is only natural, the shareholders in these concerns are anxious to be placed on immediate speaking terms with the local managers of those enterprises. Such are the sources from which the company is now deriving, and hopes to increase its revenue, and the more those resources are dealt with the more numerous will be the messages interchanged between the source of supply and the immediate sources of demand. Independently of subsidies, the annual revenue is estimated at £108,000 per annum, not taking into account what may be the annual increment of that trade for the next forty years, during which period, as has been already stated, the West India and Panama Company will enjoy the monopoly of it. The financial arrangements necessary to carry out the agreement with the Central American Company practically involve a very little increase of capital. That company is to receive £900,000 in fully paid up ordinary £10 shares for the full surrender of their property, which is money's worth for money. A sum of £100,000 will be employed in duplicating and renewing existing lines, as well as to lay the cable to Surinam. There will be issued to the shareholders £100,000 of 10 per cent. second preference shares, which will be, to all intents and purposes, a working capital. Out of this sum the company will provide a maintaining ship to look after the repairs of the several cables, and thus secure an important saving in the cost of keeping the lines in proper working order. This consolidation brings all the working lines of the world into harmonious action.

The plan proposed is well adapted for resuscitating this unfortunate West India and Panama Company, placing its affairs upon a sound and prosperous basis, and securing at the same time an ample return to the shareholders upon the capital invested. Taking the estimate of the company's original prospectus of a total revenue, with conditional subsidies, of about £170,000 per annum—but the total, after payment of the rebate, to be inclusive instead of exclusive of the North and South American traffic—and allowing £35,000 per annum for working expenses and maintenance of a repairing ship, the balance of £135,000 would suffice to pay a dividend of nearly 7 per cent. per annum upon the proposed total ordinary capital of the company of £1,471,910, besides providing for the dividend on the preference shares already issued, and on the additional preference capital now proposed to be raised.

Military Telegraphs.

CONGRESS appears to be bestowing a favorable consideration upon the bill authorizing the construction of a military telegraph line from Fort Sill to San Antonio, and thence to the Gulf coast. We also learn that the Secretary of War, Generals Sherman and Sheridan, and other prominent military gentlemen, are warmly in favor of the project to continue the Arizona line by way of the Rio Grande settlements on to Santa Fe. To show the paramount importance of such constructions in the Territories, especially those like Arizona, being settled up in face of Indian hostilities, we will cite only the one case of the recent San Carlos outbreak and its prompt termination. The Apaches broke out there about February 1st, and immediately commenced their murderous depredations upon the settlers on the Gila and San Pedro rivers, extending their incursions to the doors of Tucson. But equally quick with their irruption was the alarm sounded by the telegraph, and at once expeditions of soldiers and friendly Indian scouts were on their way to the mountains in which these marauders were thought to have taken refuge. This outbreak is now ended; our troops have fought the enemy in their chosen stronghold, and the Indians are now only too glad to accept General Crook's terms. The cost of this telegraph has been a mere song, and its maintenance, we have every reason to believe, does not cost Government anything—the receipts of the line from citizen patronage about defraying expenses and paying operators' salaries. To continue this to the Verde and the Apache reservations in this Territory, and, in one word, to connect by the electric wires all the important reserves and prominent military stations in Arizona, New Mexico and Texas, will be the wisest and most economical act of legislation regarding army or Indian affairs our Congress will have performed since the war. The whole work con-

templated can be put up by soldier labor, equipped and supplied, for less than \$250,000.—*Arizona Miner*.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Electric Protection for Express Cars on Railroads.

TO THE EDITOR OF THE TELEGRAPHER.

AN apparatus, similar to that suggested by Mr. Miller in the last number of THE TELEGRAPHER, was patented May 28th 1872, by Samuel J. Hoffman, an old telegrapher, now residing, I believe, at Mobile, Alabama. The patent was published on page 347 of Volume VIII of THE TELEGRAPHER. It was a very simple and practical arrangement, being so arranged that when the safe was put into its proper position in the car the circuit was switched through it, and it could neither be opened or moved from its position, nor could the door of the express car be opened by any unauthorized person without sounding an alarm in the engine or in the baggage room. I am under the impression that the Southern Express Company has made use of this invention, but know nothing about the particulars.

F. L. POPP.

Elizabeth, N. J., June 8th, 1874.

The Secrecy of "Government Telegrams" Secured by the use of the Automatic Telegraph.

TO THE EDITOR OF THE TELEGRAPHER.

IN reference to the intercepting or taking off messages from telegraph wires, as referred to in the resolution introduced on the 23d of March last in the House of Representatives at Washington, involving the want of secrecy in the handling of Government telegrams, Mr. Edward Clark, in his reply to the Hon. James E. Blaine, Speaker of the House of Representatives, very truly says that in some cases the wires connect with instruments in hotels, and that all the wires connect with various cities and stations between Washington and the northern cities.

Permit me to say that the trouble does not end here, and that Mr. J. G. Smith's suggestions, as regards the use of silent Morse instruments in any form, offers no security whatever against the abstraction by unauthorized persons of telegrams from the through wires at way stations, or at any point on a line of telegraph by any ordinary Morse operator as well as by experts, and, therefore, does not, in my opinion, meet the requirements, in as far as relates to the abstraction of Government or other despatches.

The only security lies in the use of the "automatic telegraph," for the following reasons: First, by causing the pulsations of electricity to travel at any rate of speed above that at which a Morse expert is only able to interpret the same either by feel, taste, or by sound. I here refer to the American automatic telegraph, which has been in practical public operation for over two years between Washington and New York. It is an impossibility for the greatest Morse expert to abstract by feel, taste, or by sound, at any point on this line, during automatic transmission of a telegram, as in such attempts it becomes to the party "ignotum per ignotius." And in regard to the office, the *modus operandi* is that of silence; and it matters not how many persons may be in each office during the transmission or reception of a message, by my automatic system no one but the copyist need know its purport; and, to meet the copyist's case, Mr. Edward Clark suggested the propriety of passing a law fixing a penalty or punishment on any person who may divulge any message sent by telegraph.

GEO. LITTLE,
Passaic City, New Jersey, U. S. A.

June 9, 1874.

New Bonds of the Western Union Company.

THE Western Union Telegraph Company are having engraved \$1,500,000 of new bonds. As some misapprehension existed on the street, with respect to the uses for which these bonds were intended, Mr. Mumford, the Secretary of the company, said that in a year from next November \$1,500,000 of the company's bonds would mature. The recent forgeries of Western Union bond certificates had created some uneasiness among the bondholders, and the company had ordered the preparation of a new lot of bonds having twenty years to run, and being exchangeable for the old bonds at the option of the holders. By this measure the old bondholders would be protected by a new, ornate, and more complicated bond, and the debt of the company would not be increased a dollar.—*New York Tribune*.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JUNE 13, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

TERMS OF SUBSCRIPTION.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

A Section of the New Atlantic Cable Laid.

THE arrival of the cable steamship Faraday at Portsmouth, N. H., on Monday last, after laying the section of the new Atlantic Cable between Berry Head, Nova Scotia, and Rye Beach, N. H., has attracted much attention to the enterprise, and has proved a sensation for the citizens of Portsmouth and that section of the country. As will be seen from the report, which we print in another column, the Faraday has successfully laid the section of the cable between Tor Bay, Nova Scotia, to within ten miles of Rye Beach, N. H., where the cable is to be landed and now awaits the arrival of her consort, the steamer Ambassador, with the heavy shore end of the cable, which, from some unexplained delay, did not sail from England until the 2d instant, and, therefore, will not arrive, probably, before Saturday or Sunday. After the laying of the shore end at Rye Beach, the Faraday will proceed to lay the remaining cable on board between Nova Scotia and the Newfoundland coast, and then return to England, take on board the long section of the cable, and proceed to lay it from the coast of Ireland to the coast of Newfoundland, where it will be connected with the buoyed end of the cable previously laid.

It will thus be seen that some weeks must yet elapse before the cable will be completed and communication established over it, even if no unforeseen obstacles or accident should intervene to cause delay. Thus far the enterprise seems to have been successful, and the qualities of the Faraday as a cable steamer, for which purpose she was specially constructed, have been practically tested. We do not anticipate any greater delay in the inauguration of this competing telegraphic enterprise than is indispensable to do the necessary work; and during the next month we confidently anticipate announcing that an independent Atlantic cable telegraph is in operation.

The origin of this enterprise may not be generally known. In 1866 a company was organized in this country under the name of the American Atlantic Cable Company, for the purpose of laying an independent Atlantic cable, and, in March of 1867, an Act of Congress granted to the company the right to land and operate telegraph cables on the coast for twenty years. The promoters of the enterprise then attempted to raise the necessary capital to lay a cable from Holland to the

United States. This attempt was a failure, and for a while the project lay dormant. Subsequently another attempt was made to procure the means required to lay a line from Ireland to the United States, which met with but little success. About two years ago the requisite amount was subscribed, £1,350,000, and in February, 1873, the contract for the construction and laying of the cable was made with the well known house of SIEMENS BROTHERS, of London. They contracted to construct the cable, lay it at their own risk, and deliver it to the company in working order, thirty days after connection is made and the cable in operation.

A new company had meantime been organized called the Direct United States Cable Company, which acquired the rights of the American Atlantic Cable Company, and raised the capital. No capital was invested in it in this country, as our capitalists have no faith in ocean telegraph enterprises, and persistently refuse to invest any money in them. The experience of the new company, in this respect, was not different from that of the old companies, neither of which ever succeeded in securing any material pecuniary assistance here. The capital of the new company was mainly raised in England, though portions of it was subscribed in France, Belgium and Holland. The Company possesses a charter in New Hampshire under the title of the New Hampshire Land and Ocean Telegraph Company to obviate any possibility of interference with their operations in that State.

Two of the contractors, the Messrs. SIEMENS, came over in the Faraday, and were present at the banquet given by the citizens of Portsmouth, on Tuesday evening last, at the Rockingham House, where they were feted and lionized. We should imagine that it must seem strange to them that they should be thus enthusiastically received by a public which utterly refuses to aid them in their great undertaking pecuniarily, and not only them, but all other ocean telegraph enterprises of magnitude.

As a people we are ready to glorify the projectors and those who carry out enterprises which are of public benefit and utility, but we don't propose to invest any money in such enterprises so long as foreigners will do it for us. We retain, however, our inalienable right of grumbling at and denouncing those who do us these favors as soon as the brief season of glorification and congratulation is over. This part of their experience has yet to come for the managers and investors in this last enterprise; but they may rely upon it that the press and people of the United States will not be modest or backward in exercising this right.

The Telegraph in Wall Street.

WE do not propose to treat of the admirable and ingenious special telegraphic facilities which have been provided for the use of the brokers and others who have business in gold, stocks and other securities—with these our readers are tolerably familiar, but with the dealings and dealers in telegraph stocks. Within the last two or three years telegraph shares have become an important element in the business of the "street," and are dealt in, at times, to an enormous extent. More than a third of the entire capital stock of the Western Union Telegraph Company has, at times, been bought and sold within a few hours on the street and in the Stock Exchange. More recently the shares of the Atlantic and Pacific Telegraph, the American District and the Gold and Stock Companies, have been placed on the list of shares dealt in at the Stock Exchange, and have been bought and sold to some extent. The Western Union stock is a favorite with the brokers, as it fluctuates constantly—sometimes as much as three or four per cent. in a day, and is, consequently, a good one for those who wish to make a profit by a turn, as it is termed—that is, by buying or selling for a rise or fall, as the case may be.

All sorts of stories in regard to this stock are constantly circulated; dividends are declared or the company is rapidly going to the dogs—it is about to absorb,

or has obtained the control of all the competing companies—a powerful opposition has been or is being organized, etc., etc., as the interests of those telling the tales is on the "bull" or "bear" side. Within the last two years more dividends have been decided upon, according to our voracious stock jobbing friends, than would have made the fortunes of even moderate holders of its stock. "Points," in regard to Western Union, are constantly plentiful on the street as blackberries in August, and may, of course, be implicitly relied upon. Any persons who have money to invest can be accommodated to their heart's content, and if it should not prove a permanent investment, whichever way they may operate, may consider themselves fortunate, especially if they are guileless and inexperienced in the taking ways of Wall street operators.

We have no doubt but that eventually telegraphs will become reasonably profitable; and the Western Union Company, as our readers are aware, has just declared a moderate dividend, but, as yet, there is no especial encouragement for those who desire to obtain regular returns of income for capital invested. We should be glad to see telegraph shares taken out of the list of "fancy" stocks and placed among "investment" shares; and, with proper management, we think it can be done. This would, however, spoil them for the purposes of the speculators and brokers, for whom regular dividend paying stocks have little attraction or—profit.

An Editor and Telegrapher in Luck.

IN 1862 Mr. FREDERICK J. GRACE, editor of the *Journal of the Telegraph*, who was then a telegraph operator, was employed in a professional capacity with the United States expedition to recapture New Orleans, and was on board Farragut's fleet when it ran past the forts up to the city. A large amount of property was captured and turned over to the Government. The matter was brought before Congress after the war was over, and an Act passed authorizing the payment of prize money from the Treasury to those engaged in the capture, and Mr. GRACE has just received notice from the Fourth Auditor of the Treasury Department that \$350 has been awarded to him as his share.

We congratulate our cotemporary on this streak of luck, and it will afford much pleasure to his numerous friends to hear of his good fortune.

Lightning and Thunder all Round.

THE very hot weather, which has prevailed lately, has resulted in extraordinarily severe electrical storms in widely extended districts of country. Such a storm took place in New York and vicinity on Tuesday evening of this week, and for some hours the flashes of lightning and reverberations of thunder were incessant, and, at times, terrific. The lightning struck in many places, and things were decidedly lively around the telegraph offices. The discharges of atmospheric electricity along the line of the New Jersey Central Railroad were so excessive that the operators were driven out of some of the offices, fearing to remain in the vicinity of the wires and instruments.

Personals.

MR. W. J. USSERY, formerly day operator at Jarvis station, Canada, Air Line of the Great Western Railroad, has been appointed agent at the Stevensville, Ontario, station of the same company. He had the agency for the Montreal Telegraph Company at Jarvis for about fifteen months, and conducted it to the satisfaction of the public as well as the company.

THE Bureau County Republican of Princeton, Ill., says: W. J. JOHNSTON, the efficient manager of the Great Western Telegraph Company in this city started West on Tuesday, with his family. He expects to be gone several weeks, and will do up Kansas, Iowa and Missouri before his return to this city. GEORGE WATERSON fills his place during his trip.

MR. WM. E. SMITH, manager of the San Diego, Cal., Western Union office, has returned to the San Francisco, Cal., office of the same company.

MR. D. W. THOMPSON has accepted the appointment

of manager of the San Diego, Cal., Western Union office, *vice* Mr. WM. E. SMITH, transferred to San Francisco, Cal.

The Telegraph.

The New Atlantic Cable.—Arrival of the Steamship Faraday at Portsmouth, N. H.

The steamship Faraday arrived at Portsmouth, New Hampshire, on Monday last. Her arrival was delayed by dense fogs—in consequence of which two or three days were lost. She has successfully laid the section of the new cable, of the Direct United States Cable Company from Berry Head, Tor Bay, Nova Scotia, to the New Hampshire coast. No hitch or accident of any kind occurred in laying the cable from Nova Scotia to within ten miles of the shoals, where it is buoyed.

The Faraday is now in the harbor, at Portsmouth, and lies at one of the Government buoys. She is much the largest craft, ever in those waters, and attracts a great deal of attention.

Mr. Siemens, who is on board of her, and has general charge of the work, received a despatch from London, on Monday, stating that the steamer Ambassador, with the shore end of the cable for Rye Beach, did not leave England until the second instant, and, consequently, she cannot arrive as soon as was expected—probably not before the 12th inst., or later. She was not constructed specially as a cable ship, but is a fast boat, and has been engaged in cable laying before. The stay of the Faraday at Portsmouth is uncertain, but she will probably remain until after the arrival of the Ambassador, after which she will proceed to lay the remaining cable on board between Nova Scotia and the Newfoundland coast. This having been done, she will return to England, take on board the remainder of the cable, and lay the long section between Ireland and Newfoundland. The deep sea cable is very strong and light, weighing only three tons to the mile. The shore ends are, as usual, very large and heavy, being two and a half inches in diameter, and weighing eighteen tons to the mile. There are also two others, intermediate sizes, for the shoal waters off the coast.

As soon as the actual arrival of the Faraday was known, the cutter Levi Woodbury, with Colonel Eastman, the agent and representative of the cable company in this country, ex-Governor Smith, of New Hampshire, representatives of the press, and other citizens on board, steamed out from Newcastle, and the party were taken on board the Faraday near the shoals, and, as this section of the cable had all been laid, Captain Trott and Mr. Siemens were kind enough to take up a portion of it, and exhibit the process for their information and gratification.

Mayor Miller, and a Committee from the Board of Aldermen of Portsmouth, went on board of the Faraday, down the harbor, and tendered Captain Trott and his officers, and the electricians on board, the courtesies and hospitalities of the city. A splendid dinner was served in the handsome saloon of the Faraday, complimentary to the visitors, Mr. Siemens presiding.

A banquet, complimentary to the officers of the ship and the party of electricians, was given at the Rockingham House Tuesday evening by the citizens of Portsmouth.

Extension of the Atlantic and Pacific Telegraph to Long Branch.

The Atlantic and Pacific Telegraph Company having leased the Marine and Inland Telegraph Company's lines, have opened an office in the West End Hotel at Long Branch, N. J. The lines are being put in first rate condition. This line extends to Sandy Hook, and formerly connected with the Pacific and Atlantic Telegraph lines, now worked by the Western Union Telegraph Company.

The Reporting Telegraph in Canada.

The Financial Telegraphic Quotation Reporting System, which has been in operation in this city for several years, and in other American cities, is about to be introduced in Montreal, Canada. The instruments and apparatus of the Gold and Stock Telegraph Company are to be used.

The New Western Union Telegraph Building.

The upper stories of the new building of the Western Union Telegraph Company, corner of Broadway and Dey street, are making good progress. The walls are completed, and the iron framework for the roof is being put up. The building will soon be covered in, and work on the interior will be commenced. To passengers on the North River ferries, approaching the city, the telegraph building and the new Post-office building, on City Hall Park, loom up in a most imposing manner.

A Strike of American District Telegraph Messengers.

TELEGRAPHIC strikes have been rather out of favor for the last few years, but a small one occurred in this city recently, which, however, was of brief duration, and failed to accomplish its object.

The messenger boys of the American District Telegraph Company are paid \$4 per week for their services in all of the districts, but heretofore while in some districts they were required to devote but eight hours a day to their duties, in others they were on duty ten hours, although receiving the same wages. Last week the company decided to fix the time at ten hours throughout the city. This naturally did not please the eight hour boys, and some twenty of them from the thirty-first district waited upon Vice-President Grant, at No. 62 Broadway, to demand an increase of wages. Three or four of the leaders were discharged on the spot, and the others fined one dollar each for leaving their posts without permission, and this ended the affair.

Foreign Telegraphic Notes.

The Colony of Demerara, West Indies, has voted \$24,000 for the construction of a telegraph line to connect the west coast of the colony with New Amsterdam.

A press despatch from Panama states that despatches sent through the West Indian cables do not come through in a few hours, as the cable officials have publicly announced, and, consequently, great losses may occur from the delay. For example, New York despatches of the 20th of May, to connect with the steamer for the South leaving on the night of the 24th, were not delivered from the office of the Colon Cable Company here till the morning of the 25th, after the steamer had sailed, although they were received in Panama on the morning of the 24th. Why there should be this detention of twenty-four hours in the said company's office is what no one can make out. Delays are by no means uncommon, and naturally lead to much complaint. New York telegrams of the 7th inst., intended to connect with the steamer leaving for Peru on the morning of the 10th, were not delivered till the 11th. This causes a detention on the isthmus of at least one week.

Telegraphic and Electrical Brevities.

THE office of the North Shore Telegraph Company, at the Pavilion Hotel, Glen Cove, L. I., has been opened for the season with Miss Montfort as Manager.

It is rumored that an opposition to the American District Telegraph Company is about to be started in New York. It is rather difficult to see how such a company can prove remunerative; but competition is said to be the life of trade, and parties investing their money probably know how it is.

The Colusa, Lake and Mendocino, California Telegraph Company have opened offices in Turner's, in Bear Valley and Mountain House, on the road to Sulphur Springs.

The Western Union Telegraph Company rank the San Diego office third in importance in California.

The *San Diego* (Cal.) *World* says: Mr. J. B. Smith is at present fingering the military telegraph instrument. If the necessities of the line demand a special operator it is to be hoped Mr. Smith will be permanently stationed here.

Return of Mr. W. E. Smith to San Francisco, Cal.

Mr. WM. E. SMITH, who, for the last two years, has been Manager of the San Diego, Cal., Western Union Telegraph office, in which position he has obtained the esteem and good will of the press and the public by his ability and courtesy, has been recalled to the San Francisco office of the same company.

The *San Diego World* of May 27 thus pleasantly refers to his departure:

"Mr. Wm. E. Smith, late Manager of the Western Union Telegraph Company in this city, has been called by the General Superintendent to San Francisco, his services being required to fill a position at the headquarters of the Pacific Division. Mr. Smith leaves San Diego with the good wishes of hosts of friends. As a representative of the Western Union Company he has, so far as our experience teaches us, managed the affairs of that corporation with ability and impartiality, and, as an urbane gentleman in his personal relations with the people of San Diego, he has certainly commanded the esteem of all who came in contact with him. Mr. Smith is succeeded by Mr. D. W. Thompson, an old and valued employe of the company, and a gentleman who comes highly recommended, not only by the Western Union officials but by the best citizens of

Yreka, where he has been on duty for the past eight years."

The *Daily Union* of that city also compliments Mr. Smith and his successor as follows:

"Mr. Wm. E. Smith, who has during the last two years so ably managed the office of the Western Union Telegraph Company in this city, has been called to San Francisco to take a position at the headquarters of the Pacific Division. Mr. Smith is relieved by Mr. D. W. Thompson, an old and experienced telegrapher, and a gentleman in every sense of the word. It was our pleasure to meet Mr. Thompson yesterday, and we most cordially commend him to the business community of San Diego."

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JUNE.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
4	72½ 72¾	.....	.....
5	71¾ 72¾	.....	.....
6	71¾ 71¾	.....	48 48
8	71¾ 72¾	.....	.....
9	71¾ 72¾	.....	.....
10	71¾ 72½	.....	.....

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ending May 12, 1874, and bearing that date.

150,847.—RECEIVING INSTRUMENT FOR CHEMICAL TELEGRAPHS.—Thomas A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C.—Case 72. Application filed July 29, 1873.

A stylus for a chemical receiving instrument, in combination with mechanism for communicating to such stylus a rapid vibration toward and from the paper for the purposes set forth.

150,848.—CHEMICAL OR AUTOMATIC TELEGRAPH.—Thomas A. Edison, Newark, N. J., assignor to himself and George Harrington, Washington, D. C.—Case 64. Application filed January 15, 1873.

Uses an induction coil as a relay or repeater at intermediate points, the induced current taking place of fresh battery current.

A circuit for chemical telegraphs composed of the primary circuit, operated by the transmitting instrument, and an induction relay coil to act in the receiving instrument by a secondary circuit, substantially as set forth.

Trade Mark registered during the week.

1,792.—MECHANICAL TELEGRAPH INSTRUMENTS.—Ralph W. Pope, Elizabeth, N. J. Application filed April 16, 1874. "Snapper."

For the week ended May 19, 1874, and bearing that date.

151,004.—ELECTRICAL CONDENSER.—Charles A. Browne and Isaac S. Browne, North Adams, Mass. Application filed February 14, 1874.

Each metallic sheet is embedded separately in rubber, which is then vulcanized, and a series of these thus used to form condenser.

An electrical condenser composed of rubber plates, with embedded tin foil plates constructed of independent sections, substantially as herein described, for readjusting and replacing ruptured plates, substantially as specified.

151,100.—SUPPORTS AND CONNECTIONS FOR PORTABLE TELEGRAPH APPARATUS.—Valentine Haüy de Forville, St. Petersburg, Russia. Application filed February 24, 1874.

Attached to posts at intervals along line of railway, wires being brought down thereto, and continuity of circuit preserved through a plug connection between the plates to which the wires are led. When used with a portable apparatus, central plug is removed and circuit formed through instruments placed in support.

The combination of the plates X Y Z, the bolts x y z, and plug K with the telegraph wires y' and z', and with a ground wire, z'', for operation as set forth.

151,101.—PORTABLE TELEGRAPH APPARATUS.—Valentine Haüy de Forville, St. Petersburg, Russia. Application filed February 24, 1874.

Improvement on De Forville's previous patent. Intended to be carried on railway trains. Cam wheels actuating key connected by a yoke, having a finger taking into spaces of cam, so as to fasten the series when proper cam wheel is under key. Case containing apparatus is temporarily fastened, when used, to a second box having contact plates corresponding to central plate in brackets placed in posts at suitable intervals along line of railroad.

1. The slides C' and springs X Y Z, arranged for operation, in connection with the plates v' w' and boss a'', substantially as and for the purpose described.

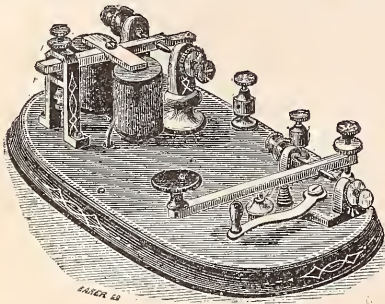
2. The yoke r, having an index finger, n, in combination with the sliding cams p, shaft f, and comb s, substantially as shown and described.

3. In combination with the plate p and index finger n, the combs s, substantially as and for the purpose specified.

Born.

COLLINS.—To JOHN F. COLLINS, of the Albany, N. Y., Western Union telegraph office, June 5, 1874, a daughter.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
Chicago, Ill.
PRIVATE LINE INSTRUMENTS.

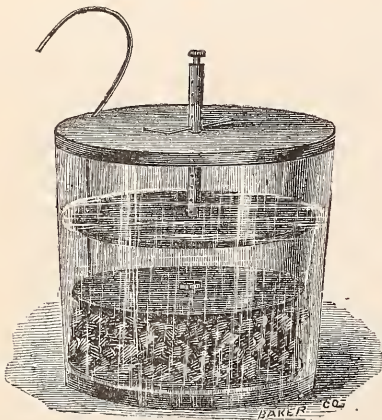


Price, \$10.00.

This Instrument is well finished, and gives a clear, loud sound. It is made to work on a line from a few feet to ten miles in length. Give length of line in ordering Instrumt. One cup of Bliss RESERVOIR BATTERY is furnished with each Instrument.

GEO. H. BLISS & CO.,
CHICAGO, ILL.

BLISS RESERVOIR BATTERY.
PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Calland Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
Chicago, Ill.

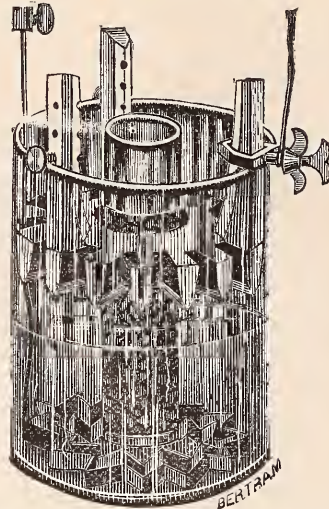
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AND 22 DEY ST., NEW YORK,
MANUFACTURERS OF
UNRIVALLED MORSE INSTRUMENTS
CHAMPION LEARNERS' APPARATUS,
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GIANT SOUNDERS,
Improved Curved Keys,
Batteries and Supplies of every Description.
Send for Circulars and Catalogue.

LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of
THE TELEGRAPHIC MANUAL,
by Mr. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

RETRENCHMENT BEING THE ORDER
OF THE DAY,
we will contribute to the good work, by offering our Superior
Telegraph Instruments at 20 per cent. below list prices.
Quality will be strictly maintained.
L. G. TILLOTSON & CO.,
9 Dey Street, N. Y.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.
A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.
It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.
Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.
All kinds of Battery and Battery material for
WATTS & CO.,
47 HOLLIDAY ST., BALTIMORE.
OUR ILLUSTRATED CATALOGUE NOW READY.

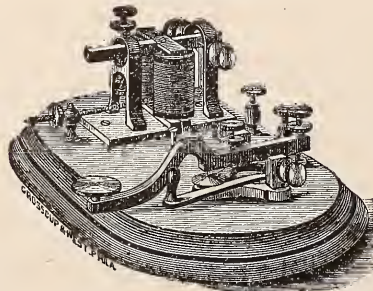
GOOD NEWS FOR TELEGRAPH STUDENTS.

An Instrument has been invented, which is now offered for sale—prices within the reach of all—enabling both young and old to become proficient at a minimum expense. The beauty and finish delights all. The sound is perfect, and only needs an inspection to assure the idea of perfection of the invention.

- No. 1. Instrument, with Alphabet.....25 cents.
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A LIBERAL DISCOUNT TO AGENTS.
Send for Sample and Prices.
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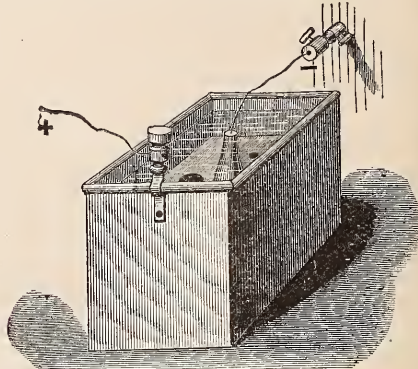
THE PENNSYLVANIA TELEGRAPHIC AGENCY,
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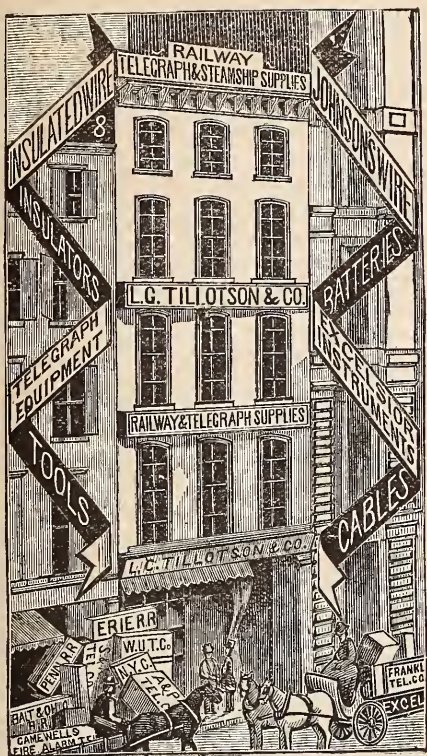
Nickel Plated.
FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.
1 cell Calland Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D.\$12 50
If money be sent in advance by registered letter..... 12 00
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Telegraphic and Electrical goods of every description at manufacturers' lowest prices.
SEND FOR CIRCULAR.

ANNOUNCEMENT!
MESSRS. PARTRICK, BUNNELL & CO.
hereby announce to the telegraphic and electrical interests of all sections that they have established a
GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT
— AT —
22 DEY STREET, NEW YORK,
where they will keep in stock all styles of First Class Latest Improved
MORSE TELEGRAPH INSTRUMENTS,
SUPERIOR QUALITIES OF BATTERY MATERIAL
AND SUPPLIES OF EVERY DESCRIPTION,
AT LOWEST MARKET RATES.
The stock will include all our celebrated specialties in
CHAMPION LEARNERS' INSTRUMENTS,
NEW GIANT SOUNDERS, PERFECTED,
IMPROVED CURVED KEYS,
ELECTRIC BELLS, IN GREAT VARIETY,
NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED
LIGHTNING ARRESTERS,
LATEST AND BEST FORMS OF GRAVITY BATTERIES.
Together with LINE WIRE,
OFFICE WIRE, BRACKETS,
INSULATORS, LINE TOOLS, Etc.
Send for Catalogue and Price List.
PARTRICK, BUNNELL & CO.,
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A NEW GALVANIC BATTERY.

Durability, Efficiency, and Economy of Expense
and Labor at last Secured.
THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.
The undersigned having secured the exclusive Agency for the manufacture and sale of the
EAGLES METALLIC BATTERY,
now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.
The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.
These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.
Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.
On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.
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Descriptive circulars and price list forwarded upon application to
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L. G. TILLOTSON & CO.,
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are offering 20 per cent. discount from list prices on all Telegraph Instruments of their manufacture.



BUY THE BEST.

IF YOU WANT

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FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

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EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

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ALWAYS ON HAND.

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TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

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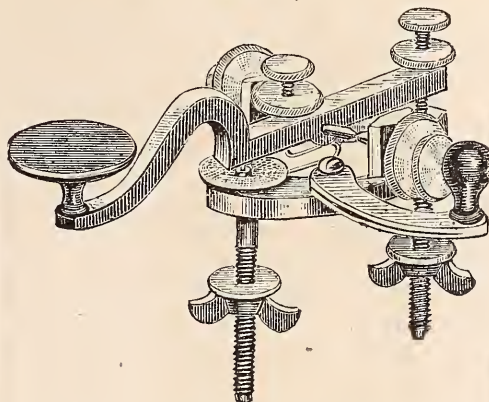
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PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by biuding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out. Acknowledged to be a decided improvement. Price, same as the ordinary key. Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments. Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

THE BEST TELEGRAPH MATERIAL IN THE WORLD

AT THE LOWEST PRICES!

The prices on our Catalogue are very low, but we are offering 20 per cent. discount from them on all Telegraph Instruments of our manufacture.

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THE "SNAPPER" SOUNDER.



NEW STYLES, NEW PRICES.

TRADE MARK "SNAPPER,"
PATENTED MAY 12, 1874.

The unexpected and growing demand for the original "Snapper" Sounder, beyond the expectations of the manufacturers, has delayed the introduction of proposed styles and improvements.

Having increased our facilities and accumulated sufficient stock to enable us to fill orders promptly, the following varieties are now offered for sale at prices which will accommodate all classes.

The "Snapper" Sounder, plain.....30c. 6 for \$1.50.
" " " nickel plated spring... 0.40.
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A few were manufactured to order with hard rubber knobs. They were so well liked that I have decided to introduce them to the fraternity. The springs are secured by two screws, and, should they break, may be replaced at an expense of 15 cents. They are thoroughly made and finished.

PRICE, 75 CENTS.



To the Dominion 5 cents each extra.
A liberal discount to agents.

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Agents for New York City.
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TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and KEY on same base, making an elegant set.
WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
WESTERN UNION (new style) SWITCH BOARDS.
ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

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VAUGHAN'S AUGURS and TOOLS in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID;
the finest in the Market.

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SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.
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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

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THIS SYSTEM OF

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WITH A CENTRAL OFFICE,

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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the original **FARMER & CHANNING PATENTS**, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THESE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

QUICK SALES, SMALL PROFITS AND SUPERIOR GOODS.

We are offering any of our unequalled Telegraph Instruments at 20 per cent. discount from list prices.

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CHARLES T. CHESTER,
104 Centre Street,
NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with **KERITE COVER**, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**, with Patent Platina Connection, introduced by us eight years since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single **DANIELL** cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made.

Our **CATALOGUE**, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH
INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

S. J. BURRELL, Superintendent,
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A MERICAN COMPOUND
TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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MAGNETO-ELECTRIC ALPHABETICAL
DIAL TELEGRAPH,
FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSI-
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MANUFACTURED BY
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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH
in the world.
It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up
THE ELECTRO-MAGNETIC WATCH CLOCK,
which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS
of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
ETC., ETC.,
OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
MANUFACTURERS AND DEALERS IN

TELEGRAPH INSTRUMENTS AND SUPPLIES
OF
EVERY DESCRIPTION,
38 VESEY STREET, New York.
NEW AND SUPERIOR PATTERNS OF

STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,
For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.
Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

BRADLEY'S BOX RELAYS AND SOUNDERS.
BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for
HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the
EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

Descriptive Circulars and Price List forwarded upon application to

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(P. O. Box 5503.) **38 VESEY STREET.**

THE GREAT RUSH
AT No. 8 DEY STREET

is caused in part by the offer of 20 per cent. discount from list prices on all Telegraph Instruments manufactured by

L. G. TILLOTSON & CO.,
8 Dey Street, N. Y.

THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 800 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Rouald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

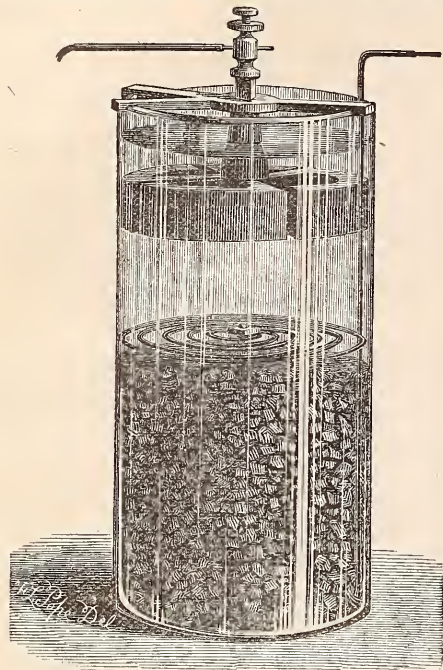
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given. The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

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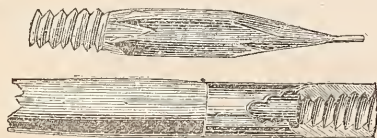
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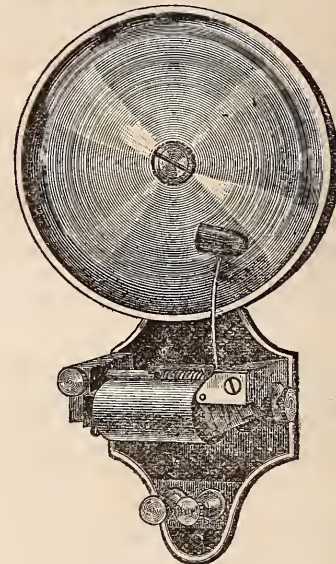
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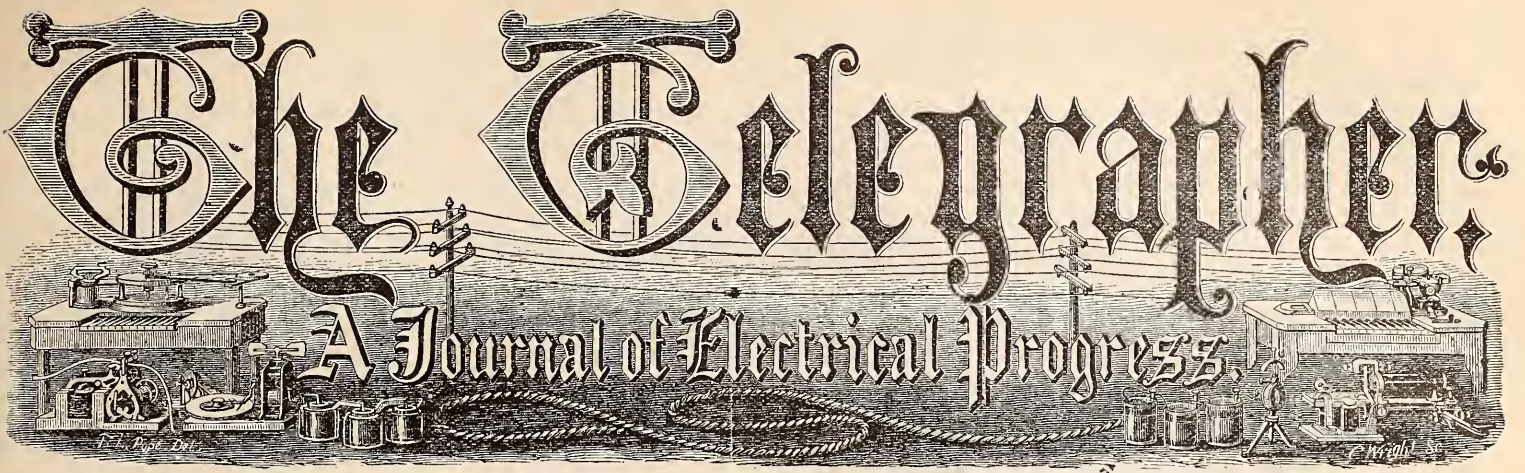
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, June 20, 1874. Whole No. 414

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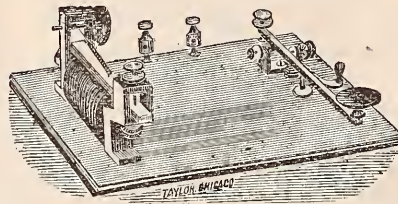
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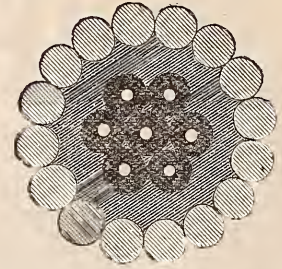
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JUNE 20, 1874.

VOL. X.

WHOLE No. 414.

Original Articles.

Bill Body's "Recollections."

BY JOE HIBBARDE.

OUR sojourn at Hayforks Junction was brief—not necessarily, but conveniently so. Three weeks was as long as we desired to remain, and it was convenient for us to accept another situation at its expiration. We met a curious character there, and he made our stay more utterly miserable than it might otherwise have been by his never ending "recollections" of those who had "gone before."

Bill Body never tired of telling us of those who had preceded us at the Hayforks, and as he had one or more "recollections" of each individual operator who ever worked there, and the number was legion, his supply of yarns was simply inexhaustible.

No historian ever recorded Bill Body, and there is no earthly reason why any should. He was a character such as every man has met, and whom none regret to leave behind. It was with great self-possession and calmness, and with very little outward demonstration that we learned, a few years ago, of his demise; but there has always been one deep regret since—we would like to have attended his funeral; we think we could have enjoyed it; and it is so seldom we do enjoy a funeral we are very sorry to have missed so rare an occasion.

It was a sultry evening in June, and we were all sitting outside, near the window, trying to comfort ourselves as much as possible with our pipes and reflections. For one, I was thinking of the past—of home, my mother, and of my old chums at school—wondering if Jimmy Dubbs would ever turn up with that half a dollar I loaned him when he ran away, ebuekled when I remembered it was counterfeit—and was drifting from this thought to others, when Bill Body's familiar and oft dreaded voice was heard, which brought me back to the living reality.

He began: "Henry Francis Goombs was the kind of a dnek one likes to see. Does a feller good to git into sich s'eicity as him once in a while. He come 'ere when they was buildin' the tunnel down on the left fork five or six years ago this last spring. He was jest the kind of a feller, he was. Allus dry 'n ready to set 'em up for the boys, 'n never complain' any 'eause we didn't 'turn the compliment. We didn't used to put on all that rigamajig to his name, though; we jest called him Goomey. He said that sounded more nat'ral, 'sides it was so handy to slap him on the back and say, 'Goomey, hev suthin'—while if you wanted to put the handle all on he'd choke afore you got through with it. So we cut it short, but we didn't slap him any to speak on. But he didn't care a cent about that. We hadn't no monee nor credit neither, an' all he had was his credit. So it all 'mounted to the same thing.

"Goomey was the curusest feller, he was. 'Tarnally git'n into some scrape or other. 'Peard he liked to have some job onto his hands, and Joe actooly seen him shed tears when things went smooth fur two or three days and he hadn't notbin' to 'count fur.

"His hours was f'm one o'clock at night, and he'd git ebuek full of old Fillet's tangle 'n he wouldn't sleep any till he come to work; but law, the boys all sed he didn't amount to nothin' after that.

"One night he come over and Williamsburgh was after him on number one—wanted to git orders to the fast express train. Goomey was more'n half seas over as usual, 'n he got holt of the wrong key—the one on the branch wire. He ansered up, but it didn't make no sort o' difference on number one, so he ansered agin slow 'n keerful. Then he did it kind o' sassy, 'n sed suthin' about them Williamsburgh chaps bein' druek. But they kept right on callin' jest the same, only a little more jerky and impatient. Then he sot down 'n leaned his head in his hands a spell 'n begun to meditate. He kept a thinkin' 'n thinkin' es much es five minits, 'n there was Williamsburgh peltin' away like all possessed. Finally, he straightened up, 'n looking straight at the machine, sed, kind o' sorryfully, but es if he meant bizness, 'I'll give you jest one more chance, 'n then he ansered slow 'n delibert like, makin' it over two or three times.

"But when he heard the same old lunc a hummin'

over 'n over agin, which showed all his pains hed been unregarded, he huy a sigh and sed, in a solomocly way: 'Well, there's only one thing to do, 'n I'm gwine to do it. I 'low I'll shet yer clack somehow. There's more'n one way to skin a eat, 'n I'll jest try t'other way.'

"And, by George, d'ye know what he did! He shoved back his chair, rose unstidly 'n went out doors 'n got a chunk of coal es big es a good sized stone 'n come in 'n let drive at the machine. But, Christopher Columbus, he didn't come within two foot of that, but he hit the kerosene lamp dead in the centre, 'n then there was fun roud the Hayforks. It set fire to the paper 'n things 'n finally burned the shanty slick 'n clean; ust to stand jest below where this is. He watched it, lugubrus like, till the wires snapped into two, 'n then he sed, sez he: 'I knew I could dry them fellers up one way of I couldn't another,' and then he lit out, 'n that's the last's ever ben heard of him in these parts.

"Everybody hated to see him go. He wasn't much like the next galoot they sent here—don't think o' his name nor don't want to. Temprince chap he was, 'n wouldn't cuss with the boys any, nor play keards or smoke, and—"

Here, to my infinite relief, I heard my call from within, and left Bill Body to edify more appreciative listeners than I.

A New Organization of Telegraph Employes.

THE telegraph employes of the St. Paul and Sioux City Railroad Line have established a telegraphic organization, and have adopted the following constitution, which has been furnished THE TELEGRAPHER for publication:

CONSTITUTION OF UNITED TELEGRAPHERS.

ARTICLE I.

Section 1. This circuit shall be known as Division No. —, of United Telegraphers.

ARTICLE II.

Section 1. The object of this organization shall be to elevate our profession to the highest degree of proficiency, to assist worthy members in time of need, and to promote the cultivation of kindly feelings among all persons employed in any capacity connected with telegraphy throughout the world.

ARTICLE III.

Section 1. The officers of this Division shall consist of one Division Operator, one Assistant Division Operator, one Division Secretary, one Division Treasurer, and three Division Directors, whose term of office shall be one year.

Section 2. The election of officers shall be by wire, and shall take place at the first meeting in ——. They shall be voted for separately, and must receive a majority of all the votes to entitle them to an election, and shall enter upon their respective duties immediately thereafter.

Section 3. It shall be the duty of the Division Operator to preside at all meetings, to enforce a proper observance of the Constitution and By-Laws of the Division, and he shall have a casting vote in case of a tie upon any question.

Section 4. The duty of the Assistant Division Operator shall be to perform the duties of the Division Operator in the absence of that officer.

Section 5. The duties of the Secretary shall be to keep all the books of the Division, except those of the Treasurer, attend to all correspondence, call meetings of the Division, keep a roll of the members, which he shall call at the opening of every meeting, and perform such other duties as may be provided in the following articles.

Section 6. The duties of the Treasurer shall be to receive and disburse all the funds of the Division, keep a book of individual accounts, pay all bills approved by a majority of the officers and members, and render vouchers for the same, and at each regular meeting, when called upon to do so, report the financial condition of the Division.

Section 7. The duties of the Directors shall be to investigate applications for assistance made by members of the Division, or of any Division organized under this Constitution; to order the Secretary to call special meetings, and to present to the officers and members of the Division the wants and condition of applicants, and to perform such other duties as are not provided for in this Constitution.

Section 8. No officer shall be entitled to compensation for labor unless the members of the Division shall see fit to grant such compensation.

ARTICLE IV.

Section 1. Those desirous of becoming members can be proposed at any regular meeting, but must be balloted for at the next ensuing meeting.

Section 2. Upon a ballot for membership three negative votes shall exclude the candidate.

Section 3. Any person whose application for mem-

bership has been rejected may renew the application at the expiration of two months after such rejection.

Section 4. When a rejected candidate or expelled member leaves the circuit to which application has been made for membership, or from which such member has been expelled, it shall be the duty of the Secretary to notify adjacent circuits of the same in writing, and of the cause of rejection or expulsion, if known.

Section 5. All persons who are elected to membership must authorize the Division Secretary, in writing, to add their names to the list of members under the Constitution and By-Laws, pay their initiation fee and regular dues to the Treasurer, and furnish their address to the Division Operator and Secretary within five days after notice of such election has been given, or forfeit the right to membership under such election.

Section 6. When a member wishes to withdraw from the Division to join another Division, a final card can be obtained, through the Secretary of the Division, to that which the member wishes to join, provided such member is clear of the books of this Division, and the application is accompanied with fee.

Section 7. Members shall pay monthly as dues a sum not less than ten cents.

Section 8. The fee for initiation shall be fifty cents.

Section 9. The fee for joining by card shall be twenty-five cents.

Section 10. The fee for final card shall be five cents.

ARTICLE V.

Section 1. Any member who may be indebted for four months' dues, unless out of employment, or unable to perform duty, shall be expelled from the Division.

Section 2. Any officer negligent in the performance of duty shall be fined twenty-five cents for each offence, and, if not paid, shall be expelled after the second offence.

ARTICLE VI.

Section 1. Any member in good standing shall, in case of sickness or disability, be entitled to receive such benefits as may be fixed by the majority of the members present at the meeting at which the application is presented, unless destitution is caused by intemperance or immoral conduct.

Section 2. When a member is sick or destitute it shall be the duty of such member to report the same to the directors of the Division, when assistance is required from the Division.

ARTICLE VII.

Section 1. The stated meetings of the Division shall be held monthly on ——— at — P. M.

Section 2. The Division Operator shall call special meetings for business at the request of a regular quorum of members, or whenever he may deem it expedient to do so.

Section 3. Ten members shall constitute a quorum for the transaction of business at regular or special meetings.

ARTICLE VIII.

Section 1. The Treasurer of this Division shall give a bond in the sum of one hundred dollars, for a membership of thirty or less, and twenty-five dollars additional for each additional ten members to the Division. This bond shall be signed by two responsible parties of the place of which the Treasurer elect is a resident, and must be placed in the hands of the Secretary previous to the retirement of the Treasurer of the year previous.

ARTICLE IX.

Section 1. In case of any office becoming vacant, the vacancy shall be immediately filled by a new election.

ARTICLE X.

Section 1. Every alteration, amendment or addition proposed to the Constitution or By-Laws, shall be delivered in writing to the Division Operator, who shall publish the same to the members. At the next regular meeting it shall be considered, and the Division Operator instructed how to present it to the annual meeting of the State Association.

[From the Journal of the Society of Telegraph Engineers.]

On some Points in Connection with the Indian Telegraphs.

BY W. E. AYRTON.

(Concluded from page 140.)

Signaling Instruments.

THE receiving instrument employed in India is what is called a sounder—that is, a simple electro-magnet, the armature of which is held back by a spring. For each current passing through the electro-magnet two distinct sounds are produced by the armature striking against two stops, which limit respectively its downward and upward motion. If the signaling current be of short duration these two sounds follow one another in rapid succession, and the signal produced is equiva-

leat to a dot. When the signaling current is of longer duration the interval separating the two sounds is longer, and the signal is equivalent to a dash. The advantage of the sounder over the ordinary Morse recorder, or any other instrument read by sight, is that it is so very much more easy for the signaler to hear the instrument and write down the message than to have perpetually to look backwards and forwards from the receiving instrument to the paper. It is just as much easier for a signaler to receive with a sounder than with a Morse recorder as writing from dictation is easier than writing from a copy. The only case where Morse recording instruments are used in India is where messages are being received from or are en route to places outside of India, Burmah or Ceylon. To facilitate this reading by sound the receiving signaler gives an acknowledgment by sending a dot at the end of every word, and the sending signaler continues repeating the word until he gets this acknowledgement. This is the same plan as is adopted with the ordinary needle instrument. This, of course, prevents the necessity of asking for repetition of various words at the end of the message. There might be a little difficulty in using this plan with the Morse instruments in England, as on account of the double current system that is extensively used in this country the line is disconnected from the key by a switch while receiving. This switch is dispensed with in India, as only the copper current is used. On all circuits, long or short, Siemens' polarized relays are employed, and this is obviously the most efficient and economical mode of working.

It is possible, of course, to produce good signals in one or the other of two ways—either by using a strong signaling current, and then the relay may be dispensed with, or by using a weak current and working the receiving instrument with a strong local current generated in the receiving office. Now, on every line a certain percentage of the current leaving the sending station is lost, therefore the smaller the current leaving the sending station the less is the absolute loss; and not only this, but the percentage lost on any particular line increases somewhat with the current, Ohm's law not being strictly true for leakage of insulators, or perhaps rather the resistance to surface conduction varying with the current. Consequently, there is a double gain in using a small signaling current, and working the receiving instrument with a strong local current generated in the receiving office.

The next point to consider—a point which I think has been much disregarded on long lines in other countries—is, what should be the best resistance for the relay to be used on each particular line? If a line were perfectly insulated the best resistance of the relay would of course be equal to the sum of the resistances of the line wire and the signaling battery at the other end; or, as the resistance of the battery is not large compared with the resistance of the line, we may say that if the line were perfectly insulated the best resistance of the relay would be equal to the resistance of the line. Mr. Schwendler, however, by taking into account the average per mileage leakage on the different lines in India, has calculated that the resistance of the relay should be about five eighths of the true wire resistance of the line, and, consequently, the relays for the different lines are now made in accordance with this rule. We have not yet, however, used any relays having more than about 3,600 or 4,000 ohms resistance.*

Of course, in using this rule of Mr. Schwendler's, the farthest distance from which the relay will have to be worked without translation must be considered, as that will be the case in which the current will be weakest, and when it will be most important to have the best resistance for the relay.

As the plan of receiving an acknowledgment after every word sent is, as I have already explained, used in India, the line cannot be disconnected from the receiving instrument during sending. The static charge which accumulates in a line when a current is sent, and which is always discharged at both ends of a line, will therefore be discharged partly through the relay of the sending instrument. If the line be very long, and the static charge, therefore, considerable, this return current, as it is called, may be strong enough to work the relay and produce a signal at the sending station. Every signal that a signaler sends is, therefore, repeated on his own instrument, and this is very likely to prevent him recognizing the acknowledgment sent by the distant station after each word, as he would confuse it with the return current.

To avoid this a key was for some time used which put the line to earth between the two positions in which it put the line to the battery and to the relay respectively. To do this effectively required that the back portion of the lever of the key should move through a considerable space, if it was to be moved

easily, with no greater manual force than is ordinarily used in signaling, or else that a considerable force should be employed if the handle were only to move through the ordinary space. Either of these conditions were, of course, incompatible with rapid signaling. This scheme was, therefore, abandoned, and the following more ingenious discharging arrangement adopted: The line is connected in the ordinary way with the axis of the key, the copper pole of the battery with the front stud, and one terminal of the relay with the back stud, and the other terminal of the relay and the zinc pole of the battery being connected with the earth. Between the copper pole of the battery and the front stud of the key there is inserted a Siemens polarized relay, called a discharging relay, the tongue of which is always connected with the back stud of the key. When the signaling current is sent, the tongue of this relay is moved slightly by attraction, and put in connection with the earth, in consequence of which the back stud of the key is also connected with the earth, and the relay belonging to the receiving instrument is short circuited. Now, on account of the residual magnetism in the relay of the discharging arrangement, this state of things is maintained for a short time, even after the signaling current has been broken. When, therefore, the lever of the key, which is attached to the line, is disconnected from the front stud, and allowed to come in connection with the back stud, it finds the relay of the receiving relay short circuited, and which remains short circuited a sufficient length of time for the line to discharge itself; no signal, therefore, is produced at the sending station by the return current. Before, however, the acknowledgment arrives from the distant station, the residual magnetism of the discharging relay, which lasts, of course, but for a short time, has ceased, the back stud of the key is disconnected from the earth, and the relay of the receiving instrument is fit for receiving. To increase the residual magnetism of the cores of the discharging relay its coils are shunted. This, of course, diminishes the sensibility of this relay, but enables the momentarily induced current generated, on breaking the battery current on signaling, to be utilized in prolonging the effect of the signaling current on the discharging relay. The best resistance of this shunt, as Mr. Schwendler has lately determined from mathematical considerations, is equal to the resistance of the coils of the discharging relay.

When a portable receiving instrument is required, a very compact arrangement in the form of a Siemens polarized relay is employed, the tongue of which in this particular case is made of sufficient bulk to produce audible sounds in striking against the stops that limit its motion.

Batteries.

The cell in universal use in India is the Menotti, or modified Daniell. It consists of a round earthenware glazed jar, about five inches high, at the bottom of which is placed a disk of copper, to which is attached an insulated copper wire. Above the disk are put about eight ounces of crystals of sulphate of copper, above this sand or sawdust, and lastly, at the top, a zinc disk. The sand or sawdust is useful in preventing the sulphate of copper from rising to the zinc plate. The electro-motive force of this cell is remarkably constant, and the resistance, when the cell is in good order, varies from ten to twenty ohms, depending on the amount of sand or sawdust and the tightness with which it is packed. The resistance is of little consequence, when used as it is in India, on lines the wire resistance of which is from 1,000 to 7,000 units or more. For local circuits these cells are also used, but joined partly in parallel circuit—that is, copper to copper, etc., and partly in series—that is, copper to zinc, etc.

The sounders are now all made of about thirty ohms resistance, but they have been made at different times of all resistances, from three to thirty units. In each office the sounders are divided into sets according to their resistances. Each set of sounders is worked with a distinct local battery, arranged according to the number and resistance of the instruments forming the set, the actual arrangement in each case being determined by printed rules given to each office. These rules are calculated from the fact that a single sounder of the ordinary size, wound with wire so as to have about thirty ohms resistance, gives good signals with four Menotti cells in series. Such sounders, it is clear, could be worked with a portion of the line battery belonging to the particular instrument, so that in an office having no sounders of less than about thirty ohms resistance no local batteries need be necessary.

All batteries are tested three or four times a week for electro-motive force and internal resistance, and the result recorded in a book to be examined by the Superintendent and Assistant Superintendent on their periodical visits. All new cells are, also, similarly tested before being joined up in any battery. The instrument used for this battery testing is a peculiar kind of tangent galvanometer, designed by Mr. Schwendler. This galvanometer is wound with a thick and a thin coil, and has attached to it two other coils of wire of suitable resistance, which can at pleasure be put in circuit or not with the two galvanometer

coils respectively. By this instrument the internal resistance of a battery can at once be found in Siemens or B. A. units, and the electro-motive force in terms of a standard cell. It possesses, also, the following advantages:

(1.) Considerable sensibility, owing to the magnet being light and well balanced. (2.) That it is compact and very portable. (3.) That it can be used as a receiving instrument for strong or weak currents. A detailed account of this instrument may be found in a paper that I read before the Asiatic Society of Bengal, and reprinted in *The Engineer*.

The number of cells to be used in the line batteries of the different circuits is obtainable from the following rule:

		During Dry Seas.n.	During Wet Season.
For every hundred miles of No. 1 wire,		4	6
“ “ “ “ 3 “		5	8
“ “ “ “ 4 “		6	9
“ “ “ “ 5½ “		8	12
“ “ “ “ 8 “		12	18
“ “ “ “ 9½ “		16	24
“ “ “ “ 12½ “		32	48

which, with the average insulation of the lines in India, has been found from experience to allow a considerable margin above the minimum number of cells necessary to produce good signals. Of course, in using this rule, the farthest distance the battery has to work direct must be considered. In addition to this, information is also given to each office of the lengths and ganges of the various sections of all the lines in the divisions of India in which that office is situated—so that every telegraph master is in a position to decide what number of cells he should use in the dry and in the wet weather respectively for each line.

When a very portable battery is required—as, for instance, when a man proceeds out on interruption duty—the following arrangement, originally devised by Captain Mallock, is employed: An oblong wooden box, about a foot long, three inches wide and three inches deep, is subdivided into cells by divisions, which, themselves, consist each of a zinc and copper plate soldered together. The cells are filled with sand moistened with dilute sal ammoniac. This battery is, of course, not particularly constant, but is handy and portable.

Every office is supplied with a Swiss commutator, consisting of a series of vertical and horizontal metal bars, all insulated from one another, any one of the vertical bars being able to be connected with any one of the horizontal bars with a screw plug. By this arrangement any line can at once be connected with any instrument, or direct to any other line, or to earth, or to the Wheatstone's bridge, or differential galvanometer, if the office be a testing station. The metal bars should be fixed on an ebonite and not a wood backing, as is sometimes done, as the wood warps, and then the holes in the vertical bars do not coincide with those in the horizontal. At every office, also, there is a Siemens plate lightning discharger, of the proper size for the maximum number of lines to come into the office. By a late universal order the lightning discharger at every office is placed between the line and the commutator, and not, as formerly, between the commutator and the instrument. This ensures two important results: 1st, that the commutator is preserved from atmospheric discharge. 2d, any leak in the lightning discharger, caused by dirt or otherwise, will be discovered from the ordinary insulation tests of the line which are made from commutator to commutator.

Electricity in Commerce.

Not many years ago, even at the lectures of the Royal Institution, electricity was treated as a child's toy. People laughed at seeing each other undergo the electric shock, and all the young people were highly amused when they saw the hair, "like quills upon the fretful porcupine," stand on end upon a wig block; and even the lecturers did not attempt to carry the matter further than to show that the subtle agent which they were able to obtain by friction from a piece of amber was identical in some respects with the awful and terrible thunderbolt. Now, however, the state of things is quite different. First came the electrotype process, which cheapened the manufacture of all plated ware. Next came the telegraph, and now we can wait a sigh from Indus to the Pole. It is needless to dwell here upon the immense durable advantages which civilization and commerce have derived from the use of the electric fluid as the world's messenger; and one evening last week we had the satisfaction of witnessing a series of experiments which demonstrated to all who were present—some of them the most eminent electricians of the age—that the efforts which have been for years past made to turn the fluid to account as an illuminating agent, have at last culminated in success. It is not here necessary to particularize the several methods which have been hitherto tried to subdivide the current. It is sufficient to mention that, as each defect

* This resistance will seem very great to the American telegrapher, but it should be borne in mind that on the Indian lines only one relay is in circuit with the line at a time, even the sender relay being cut out, while on the American plan of working all the relays are in circuit at once, even sometimes as many as 35 or 40.—ED. TELEGRAPHER.

was detected, ingenuity, directed by perseverance, was brought to grapple with it, until experimentalists have, at length, brought the arrangements to a state of perfection. It is extremely difficult, in a notice of this kind, to explain the character of the exposition we witnessed the other evening. It will be sufficient to say that the carbon points were ignited in vacuum, which is Kosloff's system, and that the current obtained from Gramme's magneto-electric machine, which is the property of the Electric Power Company, was distributed among nine lamps, and passed about from one to another with as much ease as ordinary gas can be distributed. With the Gramme machine—the very same which has been employed in sending the current to the top of the Clock Tower at the Houses of Parliament—running at about 200 revolutions per minute, a moderate light was obtained, which was greatly improved at 300 revolutions, the maximum of intensity being obtained at 450 revolutions. The strength of the light depends upon three things—the power of the machine and the number of its revolutions, on the length and thickness of the carbon rods, and on the quality of the carbon. The experiments showed that with the same strength of current and the same number of revolutions double the amount of light was obtained with the three long carbon rods as compared with the six short ones. The experiments demonstrated satisfactorily the fact that the electric current could be subdivided, and hence, if practice confirms experiment—which it is believed it will—there is a wide field open for the application of Kosloff's system. And it should be here remarked that the form of lamp used by the inventor is also experimental, and its variation does not affect the principle. He leaves it to mechanical science to devise a lamp which shall meet the varied requirements of light-houses, mines, submarine works, railways, and other purposes, to which, it was the general opinion of those present on Tuesday, the principle is thoroughly applicable.

Such is the opinion of such men as Sir C. Wheatstone, R. Sabine, C. E., F. Braby, H. Kember, Col. Wortley, Capt. Davis, J. L. Muter, H. Holmes, M. Westerton, E. H. Walenn, W. Abbott, and of several others who feel an interest in the extension of the use of electricity to other purposes. As an illuminant its reputation is now completely established. Mr. Douglas, the engineer of the Trinity House, has reported most favorably of it, giving it the preference of every other light tried in the Clock Tower of the Houses of Parliament, on account of its safety, its cheapness, and its immense illuminating power, which he found to be three times greater than that of gas supplied with 300 cubic feet per hour. He adds that the light has been in use for the last two and a half years at Souter Point Lighthouse, on the Durham coast, and that it has never been known to fail for one moment.

We are convinced that we shall soon see the use of the fluid further extended. Metals can be dressed free from deterioration in the flame created by the fluid, which can also be turned to account as a means of heating our boilers—nay, may do away with the necessity for them, by superseding steam as our motive power.—*The Railway News.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

A Bull, and its Pecuniary Consequences.

CALIFORNIA, June 1st.

TO THE EDITOR OF THE TELEGRAPHER.

It was on a pleasant evening in June, 187-, that Billy B., the night operator at Summit Station, sat tipped back in a capacious arm chair, his feet elevated at an angle of forty-five degrees above his eyebrows, and a cheap edition of Shakspeare's plays, open at Act 1st, "Midsummer Night's Dream," lying on his lap. Some "owl" down the road kept up a merry ticking on his soulder, with the familiar call of "Sm," but no response was given. Perhaps the evening zephyr has touched his cheek with a balmy kiss, that threw him into a peaceful slumber, but, more likely, he is making up at night what he lost during the day.

Presently the "beautiful snoozer" stirs, in an instant he seems wide awake; darting his right hand forward he throws his key open, and with the dexterity of one who manipulates a key to perfection, rattles off "I, I, Sm."

The following message is rapidly traced:
"B. C."

"To Proprietor Summit Hotel.

"Have 100 gallons coffee for my men on arrival of No. 1.

(Signed), Lieut. MORGAN,
"Commanding detachment Co. B."

Billy promptly delivered the message. A happy smile overspread the landlord's countenance, for he had had government contracts before. He grasped the dinner gong, and never before did that gong give forth sounds so loud and long. It quickly summoned to his side half a score of cooks, waiters and maids; the order of the night is read, and each assigned to a post of duty. All now is bustle. The Summit Hotel being only an eating place for train men and passengers, the stock of tin ware and cooking utensils was not very extensive. Billy and the landlord skirmished around the premises for tinware, and in lieu of coffee pots, etc., clothes boilers, dish pans, milk pans, dippers, and even oyster cans were filled with water and ground coffee, and placed upon any available spot where heat could be transmitted to their contents. Quantity, not quality being desired, Billy utilized the wash basins, and made three gallons over his office fire. But two hours would elapse before the train should arrive, and it was doubtful at one time, on account of the lack of vessels to hold the beverage, if the requisite quantity could be made. What hurrying, shouting and swearing! Everybody got soaked with coffee; everything that would hold fluid contained coffee; even the china pitchers and wash basins in the rooms fitted up for the accommodation of guests had to be used. The landlord hummed around as merrily as a Sacramento mosquito; and though Billy collided with the chief cook, while carrying two of his costliest pitchers, smashing them and spilling their contents over the dining room floor, he laughed heartily over it.

Fifteen minutes before the train was due he found he had the required quantity all made. Proud of his success, and appreciating Billy's efficient services, he placed him in charge of the bar until the train arrived. To say Billy was a veritable "Knucklebone Johnny" behind that bar would be drawing it very mild. It was every man for himself, and Billy, who could manipulate a glass of "Cutter's lightning" with even more dexterity than a current of Callauds was best man in the crowd. The train arrived. Lieut. Morgan, accompanied by two men, each carrying a five gallon can, entered the hotel. The cans were quickly filled, and the men departed. "Bring on your other cans," shouted the landlord. "What other cans?" asked the lieutenant. "To hold this coffee you ordered," replied the landlord. "I ordered?" and the officer gazed about him in astonishment at the array of cans, crockery and waiters. "Yes," shouted the landlord, drawing forth his message and exhibiting it. "You ordered one hundred gallons of coffee." "I ordered but ten gallons, and here's your money for it," replied the officer, throwing down a five dollar greenback. "All aboard," shouted the conductor, and the lieutenant rushed from the room. The landlord was now frantic; he quickly followed the officer out, but the train had started, and in a few moments was thundering down the mountain side a mile away.

Then the landlord swore, and made for the telegraph office. A very emphatic, if not very elegant, salutation fell on Billy's ear. Billy was astounded. He immediately called up the "B. C." man, and told him "g. a. 'have', in that coffee message." "B. C." sent back, "Have 10—ten." That was enough. Billy had a large sized "bovine" on his hands, but his proud nature would acknowledge no error. As soon as he had succeeded in quieting the excited landlord a little he went for that "B. C." man. The line was "red-hot" that night. The wordy combat waged fierce and warm for hours, but "Morse" suffered most; dashes fell to the level of dots, and spaces were for the nonce disregarded.

The landlord endeavored to revenge his wrongs by starving Billy out, but Billy managed to have rations sent from the next station, and subsisted almost entirely on bread and cheese until he was transferred to another station, four or five days after the coffee feast. Billy had just begun to congratulate himself in escaping without pecuniary loss, and at having a much pleasanter position in his new quarters, when the pay car arrived. Billy, with light heart and nimble step, quickly presented himself before the paymaster. That official handed him part of his wages, and the following voucher for the balance:

Wm. B—, SUMMIT, June 187-.
"King of Koffee,"
To "Cardwell," Dr.
To 90 gallons coffee..... \$18 00
To 2 pitchers..... 5 00
Received payment..... \$23 00
Billy got mad over it! WART.

Discoveries and Progress in Electrical Science.

PHILADELPHIA, June 15.

TO THE EDITOR OF THE TELEGRAPHER.

If you will allow me a little space in your columns I will endeavor to give you a short article which, perhaps, may be interesting to some of your readers. No one will hesitate to endorse my assertion, I think, when

I say that wonderful and mysterious is the era upon which we have just entered; the twilight of a new dispensation has already dawned upon us, old landmarks are fast being obliterated and time honored theories exploded.

The philosophers and professors of the old school have at last been driven from their brainless theories, and are taking shelter under the shattered banner of conservatism. Radicalism is the order of the day, and he who dares not consult the signs of the times, and investigate the mighty truths beaming upon us, is only fit for the past, when men's minds revolved in a circle, and their highest aspirations were to repeat the lessons taught by their masters.

The time was when animal force predominated and man's powers were only measured by his capacity for muscular endurance—the powers of the surrounding elements being unknown—and his progress, safety and protection depended wholly on his physical resources. Manifest destiny was onward and upward, in spite of the combined powers of Church and State to strangle every new discovery in the cradle of its infancy, and consign its authors to the shades of forgetfulness. Like a two-edged sword it has cut its way through the dire errors of the past, and now stands brilliantly arrayed in the resplendent glory of its own victory. Knowledge is the result of accumulated experience. Our present greatness is but the product of all past ages. Each generation contributes something important for the benefit of its successors.

In the early period of man's existence his knowledge must have been restricted to a few simple facts, presented directly to his material or external senses. The imponderable phenomena of nature could have cast but a dim shadow over his obscured vision, and all exhibitions of the imponderable forces must have been attributed to miraculous interposition. No wonder, then, that the mysterious agent, electricity, the most subtle in nature, should have remained concealed for so long a period. The earliest record of its existence dates no further back than twenty-four hundred years.

Samuel F. B. Morse, in 1832, while steaming upon the broad Atlantic, saw through his mind's eye the silent and mysterious workings of the electro-magnetic telegraph. His enthusiasm upon the subject knew no bounds. While investigating one of the grandest enterprises ever conceived by mortal man, his phlegmatic companions around him only laughed at his supposed lunacy. Failing to procure pecuniary aid to utilize his theory, in 1837 an earnest appeal was made to Congress for the requisite funds; such, however, was the obtuseness of the honorable functionaries at Washington, that the point was not seen or reached by them till 1843, when the required aid was appropriated. Thus struggled along for eleven years, for want of the paltry sum of thirty thousand dollars, one of the most important discoveries ever revealed to man. Morse lived to realize the fulfillment of his most radical anticipations. The same Samuel F. B. Morse who, in 1840, was without fame, friends or credit to procure even an electro-telegraphic apparatus, has since been honored by men of science, courted by kings and emperors, making tributary to his genius all the civilized nations of the earth. Thus it will be seen how hard it is not only to overthrow the errors of the past, but to introduce to public favor any new invention or discovery, however plausible. Thales, a celebrated Grecian philosopher, is said to have been the first to discover this marvellous agent. His discovery simply demonstrated the existence of an unknown force or power. By rubbing his hand across a piece of amber it imparted to it a mysterious power, capable of attracting to itself light contiguous bodies. This discovery, although simple, was sufficient to immortalize the name of Thales. This power derived its name from the substance with which it was first detected. Amber, in the original Greek, is called *electron*, from which the term electricity is derived. The terms magnetism, galvanism, voltaism, faradism, etc., have no reference to different substances, but simply represent the names of individuals foremost in developing their versatile powers. Magnetism is but another name to represent one phase of the same mysterious agent. Instead of being excited by friction it exists inherently in a certain ore, first discovered by Magnes in Asia Minor, from whose name the word magnetism is derived. This ore is known by the familiar name, loadstone. It is now extensively found in various parts of the United States, and is called magnetic ore.

In 1747 Benjamin Franklin entered upon a thorough investigation of the subject. In 1751 his investigations and experiments were embodied in a series of letters, afterwards published, causing at the time great excitement both at home and abroad. In these letters he promulgated his theory of the storm cloud, differing only in volume and degree. In accordance with his suggestions, two Frenchmen—Dolibar and Delvore—each erected an apparatus for extracting from the storm cloud the dread messenger of death.

May 10th, 1752, Dolibar succeeded in bringing down the fiery messenger, announcing its presence by sparks

(Continued on page 148.)

THE TELEGRAPHER

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OF THE
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The Improvement in Business and Telegraphic Prospects.

ALTHOUGH business generally continues to be very dull, and speculation languishes, there are indications that the worst is probably past, and that by the close of the summer there will be a noticeable and encouraging revival of enterprise and business. At this season of the year there is usually a lull in business matters, and business men are more intent upon arranging where they shall spend the brief vacation, and seek recuperation of their vigor and energy, than upon initiating new and important enterprises. It cannot be denied, however, that there is more than the usual dulness the present season, consequent upon the prostration following the panic of last fall. Labor is to a greater extent than usual unemployed, and the active capital of the country is temporarily pressing upon the great financial centre of the country, where it meets with but a limited demand; and there is a plethora of money in the banks and other financial institutions in this city, which can readily be obtained in any desired amount, upon call, with first class securities as collateral, for from two to three per cent. interest. In ordinary times this would lead to an active speculation in stocks, but at the present time the prices of stocks, and even of first class securities, are much lower than those obtained previous to, and even a few weeks subsequent to the panic of September and October last. The protracted depression in business, and the unfriendly legislation of some of the Western States, is seriously affecting the railroad interest, and the prices of the shares and bonds of even first class dividend paying railroads are quoted at low figures.

Notwithstanding all this we think that the prospect is improving. One element of disquiet and uncertainty is practically disposed of for some time to come. There is now no danger of an inflation of the irredeemable currency of the country, and but little prospect of any considerable reduction of its volume. The position taken by President GRANT in opposition to inflation, and in favor of a return to a specie basis, has saved us from a great misfortune, and is one of the most important services that he has rendered to the country. We are gradually returning to a sounder financial basis, and, although some suffering is inevitable in the process, we shall eventually be more really prosperous for it. We are not yet entirely out of the woods, but the

prospect is brightening, and there is reason to believe that clear skies and bright sunshine will before long enliven the gloom which has for so many months overshadowed the business and financial interests of the country. The indications are that the crops will turn out well notwithstanding the backward spring and the devastation of freshets in some sections; and with good crops and reviving confidence the country cannot but be prosperous.

Intimately connected as are telegraph interests with the general prosperity of the country, every telegrapher must be interested in the improving prospects. The panic last fall checked telegraphic progress for the time being, and affected telegraphic interests quite as seriously as any others. Projects for extension and increase of telegraphic facilities were suspended, and have so remained until the present time. There will be fewer miles of telegraph built the present season than for many years previous. Still there will be some important additions to the telegraphic lines as it is. As we have stated, the Atlantic and Pacific Telegraph Company is to construct a line from Chicago to Omaha, to accommodate its business west of the latter place, and to afford a permanent connection through its own line with its system in that section of the country. We print this week in our columns of telegraphic news some additional and interesting particulars in regard to this new line. Besides this the same company will make other though less important additions to its facilities during the season, the aggregate of which will be considerable. The Southern and Atlantic Telegraph Company is distributing the poles for the extension of its lines south of Mobile, and will soon recommence actively the work of construction, intending to reach New Orleans in time for the fall business. Many of the lines in the south have suffered very severely this spring from the great freshets, but this damage is now repaired, and the work of construction recommenced. We understand that the Automatic Telegraph Company have in view some important movements, but cannot at present give our readers the details. We do not hear of any specially important additions to the Western Union system, but presume that that company will do something in this direction. The new Atlantic Cable is expected to be in operation in the month of August next, and if it proves successful, it will be an important addition to the facilities of the companies competing with the Western Union combination.

Altogether there is a visible and important improvement in telegraphic prospects; and if we do not realize in this direction all that could be desired, there is good reason for the belief that there is a good time coming, and that at no distant day. With reviving industrial and financial prosperity, and freed from the danger of government interference, the future of the telegraphs in this country is hopeful and promising. With economical and good business management there is no reason why telegraph property should not prove remunerative to investors as well as employés.

Telegraphic Enterprise of the English and American Press.

THE London correspondent of the *New York Tribune* recently referred to what, in that country, is considered a remarkable exhibition of enterprise on the part of the *London Times*, which expends \$17,000 per year for the use of a telegraph wire between London and Paris.

The *Tribune* very justly remarks that this enterprise "does not look so large to Americans as the letter of our correspondent would show that they think it in London. There is no first class New York journal which does not spend far more than this on the telegraphic transmission of news between Washington and New York; and there is no one which would not laugh at the idea of being confined to the use of a single wire."

There is no doubt of the fact that in the telegraphic transmission of news the American press is far in advance of the English and Continental press of Europe. We have not at hand the statistics in regard to the

quantity of news despatches transmitted by telegraph in this country, but it is enormous. No newspaper in this country can maintain its position as a leading journal without a very free and costly use of the telegraphs. In addition to the press despatches received through the Associated Press and the American Press Association, every newspaper of any pretension, and many of no special pretension as regards importance, has special despatches from correspondents in Washington, the capitals of the respective States, the Dominion of Canada, and even in Europe, who constantly transmit voluminous telegraphic reports of matters of interest, at an aggregate expense the amount of which would shock the ideas of newspaper publishers abroad. The patronage derived by telegraphs from the press makes an important figure in the annual receipts, and as the largest part of this is transmitted after business hours, it is particularly acceptable, and generally remunerative, although the prices charged are less than the regular rates for commercial despatches.

The enterprise of the American press in this respect is one of its principal and most important features, and their patrons would not be content with the meagre abstract reports which are generally deemed satisfactory in foreign journals. There has been an improvement in this respect in the leading European papers in the last few years, but they are yet far behind their American cotemporaries.

The Nonpareil Telegraph Apparatus.

THIS favorite instrument has recently been improved and a straight lever key substituted for that formerly used, and it is now the best instrument for the purposes for which it is offered, as well as the cheapest.

Messrs. F. L. POPE & Co. have sold over 2,000 of these instruments since they were introduced, and are still meeting with a demand for them.

They have just had printed a new catalogue and price list of telegraph apparatus and supplies sold by them, which may be had on application.

(Correspondence continued from page 147.)

and shocks. Eight days after this experiment the rod erected by Delyore also presented similar phenomena. These facts being unknown to Franklin, he, too, was kiting for similar results, and on the 3d of June following succeeded in bringing out from the sullen brow of the dark cloud the errand boy of the nineteenth century, announcing his presence by several smart raps over the knuckles.

For fear of failure his little son was his only confidant and attendant. He elevated his kite among the angry clouds and cagerly watched for a response. Not a fibre moved upon the cord. He presented his knuckle to the key; there was no response; minutes seemed like ages flitting before him. Upon this experiment hung the realization of failure or success. At length a slight tremor was detected in the fibres of the cord; a ray of hope gleamed upon him; on presenting his knuckle to the key he experienced a slight shock, attended with a feeble spark, increasing in power and brilliancy, till caution forbade further experiments. Thus lightning itself was snatched from its swaddling robes and received from man its first lesson.

The discovery was complete, and Franklin felt that he was immortal.

Although Franklin was not the first to attract the fleet messenger from his sullen retreat, yet it was from his suggestion that the first success was achieved, and to him there is accorded the authorship of this grand achievement. From this time onward nothing of importance occurred till the well known experiment of Galvani with the frogs, in 1790, which sat all Continental Europe in a Galvanic blaze, and finally euded in smoke. Voltaism arose from the ashes of Galvani, paving the way for our present electrical greatness.

AN OPERATOR.

Promotion of a Grand Trunk Railroad Train Dispatcher.

TORONTO, ONTARIO, CANADA, June 12.

TO THE EDITOR OF THE TELEGRAPHER.

MR. JAMES MEXON, train dispatcher of the Grand Trunk Railway, Toronto Division, has been promoted to the position of Chief Train Dispatcher of the Detroit Division of the same road, under the superintendency of Mr. Morse, the old railroad manager, and his headquarters removed to Port Huron, Michigan. His loss in our office will be felt, as he was generally well

liked, by not only his professional associates but by all who knew him.

We all sincerely wish him good fortune and prosperity in his future business and social career.

TORONTO BOYS.

Personals.

Mr. G. F. JONES, formerly of the Washington, D. C., Franklin Co.'s office, has accepted a position with the Western Union Telegraph Co., at office corner Third and Chestnut streets, Philadelphia, Pa.

Mr. CHAS. H. HAZLETON has been transferred from the McGregor, Iowa, to the La Crosse, Wis., office of the Northwestern Telegraph Co.

Mr. ALFRED BURROWS, formerly of the Guelph, Ontario, office of the Dominion Telegraph Co., who has just returned from a trip to England for his health, which has been much improved, has been transferred to the Orillia, Ontario, Canada, office of that company.

Mr. JACK MACDONALD (Canada Jack) has recrossed the borders, and is working for the Western Union Company in Detroit, Mich.

Mr. WALTER G. BROWNSON has accepted a position at No 145 Broadway, N. Y.

The Telegraph.

By Cable.

COMPLETION OF THE BRAZILIAN CABLE.

LONDON, June 15.—The steamship Africa is now making the final splice of the Brazilian cable near Madeira. Captain Halpin, the commander of the expedition, hopes to have the work completed by the 21st inst. All is going on well.

LISBON, June 16.—The steamship Africa has returned to this port after successfully submerging her section of the Brazilian cable. The line has been tested, found to work satisfactorily, and handed over to the Brazilian Cable Company. Unbroken telegraphic communication is thus established from England, through Lisbon and Madeira to St. Vincent, Cape Verde Islands.

A Model Telegraph Line.

The Atlantic and Pacific Telegraph Company are erecting a line of telegraph between Chicago and Omaha, five hundred miles, using a charcoal iron galvanized No. 10 wire, and twenty-two cedar poles to the mile, with Brooks insulators. The line is constructed by George H. Bliss & Co., of Chicago. It is to have twenty-two relays in the circuit, and the guarantee of the contractors is that it works in the rain or most humid weather, in a single circuit upon that length, to the full Morse speed of any line in clear weather, and better than a No. 6 wire on ordinary insulators. Such wire cannot be worked with that number of relays in rain without an intermediate repeater, and, with a repeater, no line can be said to be worked at full capacity of a shorter wire without repeaters.

The resistance of this circuit will be equal to a No. 6 wire three thousand miles in length. The cost of this model line per mile is not half that of a No. 6 wire upon ordinary insulators; hence the economy of using a better insulation.

Six years since Mr. F. L. Vandenburg constructed a line of two wires from Ogden to San Francisco, one thousand miles, using a No. 9 wire, except on the portion over the mountains, where a No. 11 steel wire of greater strength was substituted. At the time many doubted whether this line could be worked in circuit on account of the great length and resistance, especially in the rainy season, but with the Brooks insulators there has never been any difficulty. In a letter from Mr. Vandenburg, dated San Francisco, May 23, incidentally referring to this line, he states, "My one thousand mile circuit works as well as when first completed."

The Progress of the New Atlantic Cable.

The cable steamer Faraday, which is engaged in laying the new Atlantic Cable, did not await the arrival of her consort, the Ambassador, at Portsmouth, as it was supposed she would do, but sailed for Halifax, Nova Scotia, on Thursday, June 11. She arrived at Halifax on Saturday, when she took on board a supply of coal, and then proceeded to lay the section of the cable between Nova Scotia and the coast of Newfoundland. It is understood to be the intention to return to Portsmouth after the arrival of the Ambassador, but whether this will be done is uncertain. Both the Faraday and the Ambassador will, after laying the cable on board, return to England, when the Faraday will take on board the deep sea cable and proceed to lay the section from the Irish coast to Newfoundland. It is expected to complete the cable and have it in working order by the end of August.

Foreign Telegraphic Notes.

THE South Wales Telegraph has arranged with Queensland and New Zealand to get a cable laid from Singapore to the Queensland coast, and will ask Parliament to sanction it before the session closes.

The French Government, according to the London Times, with a view to obtain a reduction of rates for telegraphic despatches to the east, has granted a concession to an Anglo-French combination of capitalists for the exclusive right to lay cables between the south coast of France and the eastern shores of the Mediterranean, with special privileges for the direct and uninterrupted transmission of messages from England through France to the east. The concession further grants a reduction of one half of the ordinary rates over the French telegraphic system.

A prospectus has been issued in London of the Black Sea Telegraph Company (limited), with a capital of £130,000 in shares of £10 each, of which 10,000 shares are for subscription. The company have acquired exclusive concessions for thirty years from the Emperor of Russia and the Sultan of Turkey, for establishing a submarine telegraph between Odessa and Constantinople, which, besides affording telegraphic facilities for the trade of the Black Sea and Sea of Azov, will, by means of the system of the Eastern Telegraph Company, which now extends to Constantinople, complete a telegraph route to foreign countries for every part of Russia. The Telegraph Construction Company have contracted to lay the cable early next month for £97,000 in cash and £30,000 in full paid shares. The President of the Great Northern Telegraph Company is chairman.

A dividend of 7 1/2 per cent. was declared May 20th, at the meeting of the Reuter Telegraph Company, making, with the interim dividend of 2 1/2 per cent. in October, a total distribution during the year of 10 per cent.

The increase in the export of telegraphic wire and apparatus from Great Britain was remarkable in the last four months compared with the preceding year. The sums were respectively £429,643 and £122,099.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 62, UP TO AND INCLUDING JUNE 10TH, 1874.

4, 6, 25, 33, 56, 59, 61, 67, 90, 91, 93, 98, 99, 100, 121, 133, 134, 140, 141, 142, 144, 148, 153, 154, 156, 158, 160, 164, 175, 176, 177, 201, 202, 220, 235, 244, 245, 247, 254, 257, 276, 341, 346, 350, 367, 379, 380, 392, 393, 406, 411, 412, 425, 430, 431, 434, 438, 463, 482, 548, 552, 561, 577, 590, 600, 603, 604, 622, 646, 659, 661, 694, 703, 715, 723, 724, 728, 729, 735, 741, 750, 751, 756, 780, 823, 830, 831, 855, 874, 876, 883, 897, 929, 930, 931, 932, 954, 956, 957, 959, 960, 963, 964, 978, 979, 995, 998, 1023, 1024, 1040, 1046, 1047, 1055, 1072, 1084, 1103, 1139, 1143, 1152, 1173, 1175, 1196, 1198, 1200, 1211, 1213, 1221, 1224, 1225, 1234, 1235, 1248, 1251, 1252, 1259, 1268, 1273, 1290, 1292, 1325, 1329, 1359, 1364, 1365, 1385, 1389, 1390, 1391, 1409, 1440, 1470, 1485, 1517, 1518, 1552, 1555, 1560, 1568, 1582, 1591, 1593, 1594, 1635, 1656, 1658, 1667, 1669, 1672, 1695, 1707, 1718, 1720, 1721, 1728, 1763, 1765, 1766, 1767, 1789, 1790, 1791, 1809, 1811, 1812, 1830, 1831, 1837, 1838, 1847, 1860, 1869, 1874, 1877, 1881, 1906, 1907, 1911, 1913, 4914, 1915, 1938, 1943, 1951, 1957, 1970, 2017, 2021, 2024, 2025, 2027, 2035, 2036, 2044, 2050, 2057, 2065, 2069, 2086, 2089, 2097, 2099, 2106, 2110, 2113, 2116, 2118, 2138, 2142, 2145, 2147, 2156, 2157, 2160, 2162, 2164, 2186, 2191, 2194, 2195, 2203, 2205, 2206, 2208, 2223, 2224, 2225.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 61, UP TO AND INCLUDING JUNE 10TH, 1874.

31, 42, 76, 84, 154, 156, 158, 160, 164, 176, 177, 201, 202, 206, 247, 252, 312, 316, 341, 350, 411, 412, 418, 441, 482, 552, 556, 557, 566, 534, 590, 597, 642, 646, 648, 655, 659, 694, 701, 703, 710, 712, 717, 723, 724, 728, 735, 741, 780, 791, 782, 783, 785, 786, 790, 802, 809, 815, 823, 836, 838, 841, 842, 897, 904, 906, 916, 926, 929, 930, 931, 932, 944, 954, 956, 957, 959, 960, 963, 964, 979, 980, 998, 1000, 1002, 1014, 1016, 1030, 1031, 1033, 1034, 1041, 1046, 1050, 1057, 1061, 1080, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1121, 1122, 1123, 1133, 1139, 1141, 1152, 1191, 1198, 1211, 1221, 1234, 1235, 1255, 1256, 1268, 1273, 1281, 1283, 1284, 1285, 1286, 1289, 1290, 1339, 1340, 1342, 1344, 1346, 1348, 1349, 1350, 1351, 1352, 1366, 1405, 1409, 1415, 1426, 1427, 1430, 1431, 1432, 1433, 1457, 1458, 1465, 1469, 1470, 1471, 1474, 1475, 1476, 1481, 1485, 1503, 1513, 1528, 1529, 1530, 1552, 1558, 1573, 1586, 1597, 1616, 1649, 1666, 1667, 1673, 1684, 1687, 1688, 1696, 1700, 1701, 1702, 1704, 1709, 1710, 1713, 1724, 1730, 1737, 1746, 1747, 1750, 1751, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1765, 1766, 1767, 1768, 1769, 1771, 1785, 1789, 1790, 1813, 1828, 1830, 1837, 1838, 1839, 1840, 1841, 1857, 1859, 1860, 1877, 1889, 1895, 1896, 1897, 1907, 1915,

1958, 1965, 1996, 1997, 2007, 2010, 2012, 2023, 2033, 2041, 2044, 2045, 2074, 2075, 2085, 2089, 2110, 2134, 2145, 2147, 2156, 2157, 2160, 2164, 2171, 2183, 2184, 2185, 2191.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS 58, 59 AND 60, UP TO AND INCLUDING JUNE 10TH, 1874.

51, 169, 182, 428, 429, 490, 495, 496, 497, 499, 506, 503, 504, 505, 506, 507, 508, 652, 660, 684, 916, 929, 934, 1104, 1182, 1269, 1273, 1275, 1289, 1409, 1430, 1495, 1496, 1542, 1552, 1600, 1601, 1603, 1605, 1639, 1641, 1653, 1655, 1657, 1677, 1689, 1690, 1691, 1712, 1743, 1788, 1835, 1907, 1915, 1968, 2105, 2115, 2132, 2146, 2150.

MISCELLANEOUS.

55, 56 and 57.—496, 684, 800, 856, 929, 1430.

55.—1933.

58.—1275.

Quotations of Telegraph Stocks at N. Y. Stock Exchange.

Showing Lowest and Highest Prices each day during week.

Table with columns: JUNE, WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows of stock prices for dates 11 through 17.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended May 19, 1874, and bearing that date.

150,953.—PRINTING TELEGRAPH.—George W. Howe, Stevenson, Ala. Application filed June 20, 1873.

Type in a reciprocity rack. Proper type, when in position, thrown up against paper. Six keys used, the combinations of which controls all the types through one, two or three pulsations acting in different magnets.

1. In a printing telegraph instrument, a mechanism for transmitting at regular and fixed intervals of time from one to three currents or waves of electricity, which shall enter the main line separately through separate magnets controlling a series of pins, and upon arriving at the distant instrument follow corresponding paths through magnets controlling an equal number of pins, substantially as herein set forth.

2. The key-board, constructed substantially as described, in combination with the register magnets I, revolving arms K', and circuit keys or levers L, or their equivalents, as and for the purposes set forth.

3. The frame f above the key-board, and the pieces g, or their equivalents, pivoted, substantially as and for the purposes herein set forth.

4. The magnets I, in combination with the series of pins i, or their equivalents, substantially as set forth.

5. The series of register pins i, or their equivalents, for the purposes herein set forth.

6. The long register lever K, armature J1, uprights k k1 k2, arms m m1 m2, rollers n n1, chains p p1, eccentric wheel L, type frame M, and spring v, or their equivalents, operating substantially as and for the purposes herein set forth.

7. The printing magnet I, in combination with the revolving key closer and local circuit closing key or lever L3, or their equivalents, as and for the purposes herein set forth.

8. The upright lever w, spring d1, horizontal arm y, spring a' and catch z, or their equivalents, as and for the purposes set forth.

9. The upright lever v, horizontal lever N, and sounding plate O, or their equivalents, as and for the purposes herein set forth.

10. The horizontal arm P and the curved rocking piece st pivoted thereto, or their equivalents, as and for the purposes herein set forth.

11. In a printing telegraph instrument separate and independent type, movable up and down in a frame or holder, for the purposes herein set forth.

12. The movable type frame M, constructed and operating substantially as and for the purposes herein set forth.

13. The wire 4, or its equivalent, in combination with the type and type frame, substantially as and for the purposes herein set forth.

14. The index D' and pointer G', in combination with the type frame, as and for the purposes set forth.

15. The crank p2 on the axle of the spool T, for the purposes herein set forth.

16. The notched arms v2 pivoted to the paper roller frame B1, and the spring w2 pressing between them, substantially as and for the purposes set forth.

17. The upright arm z1, cross arm b2, screw rod a2, nut a2, and adjusting wire or thread f2, or equivalents, as and for the purposes set forth.

18. The long horizontal rods R, upright arms y1, curved or angular pieces b, spring w1, and catch z1 on the long printing lever K, substantially as and for the purposes herein set forth.

19. The arms K' K' confined by friction on the shaft and provided with wheels or rollers y2, and one of them provided with a tooth or projection, z1, as and for the purposes herein set forth.

20. The revolving arms K', in combination with circuit closing keys L and L', or their equivalents, as and for the purposes herein set forth.

21. The main line circuit closing levers L, or equivalents, in combination with the revolving arms, register and key-board, as and for the purposes set forth.

22. The stop d2 c3, relay magnet R', and local magnet V', in

combination with the revolving key closer, as and for the purposes set forth.

23. Additional instruments connected to a telegraph line in the manner specified, in combination with the revolving key closer, to close the circuit through the same, substantially as specified.

151,102.—PORTABLE TELEGRAPH APPARATUS.—Valentine Haiy de Porville, St. Petersburg, Russia. Application filed April 9, 1873.

Intended to be carried on railroad trains for use by those unskilled in telegraphy, being placed on brackets attached at intervals to posts.

1. The series of circuit breaking cams *g*, arranged to slide on the rotating shaft *f*, in combination with the operating key *h*, the index plate *p*, and the magnet, substantially as shown and described.

2. The guides *s t u* and impression wheel *v*, in combination with the inking roller *y*, tape reel *k*, armature *z*, and clamping rollers *w w*, all arranged for operation, substantially as shown and described.

3. The cams *g*, constructed to signal words or sentences by rotation in one direction, or numerals, when rotated in the reverse direction, in combination with the lever key of a telegraph instrument, substantially as shown and described.

4. The switch *x*, in combination with the clamping rollers *w w* and crank *i*, for operating the tape motion in receiving a message, substantially as specified.

151,157.—ELECTRIC CONDUCTING CORDAGE.—Thomas L. Reed, Providence, R. I., assignor of one half his right to Eugene F. Phillips, same place. Application filed December 15, 1873.

1. Electric cordage for switch boards, and electrical therapeutic apparatus composed of a metallic conductor, closely coiled with a tubular interior, and embraced or enclosed in and by an insulating jacket of braided or woven fibrous material, substantially as described.

2. The combination, with a spirally coiled metallic conductor, of a terminal tip, which is provided with a neck for entering the tubular interior of the coil and a shoulder for connection therewith, substantially as described.

Born.

INCORRECT ANNOUNCEMENT.

THE announcement of the birth of a son to Mr. H. C. Maynard, night manager of the Western Union, Chicago, Ill., office, in THE TELEGRAPHER for May 23, was incorrect, he having become the happy father of a daughter on that occasion.

RICE.—At Albany, N. Y., June 10, 1874, to S. C. Rice, operator, Western Union telegraph office, a son.

JONES.—Sunday, A. M., June 7th.—To G. F. Jones (formerly operator at 609 Pennsylvania avenue, Washington, D. C., Franklin Telegraph office), of the Western Union Company's (Third and Chestnut street, Philadelphia, Pa.) office, a son.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

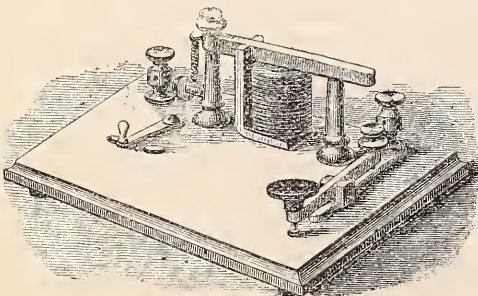
Table comparing rates for New York to Trenton, Philadelphia, Baltimore, and Washington by Automatic vs. West'n Union.

NEW YORK OFFICES:

Table listing New York offices at 66 Broadway, 21 New St., 71 Worth St., 364 Broadway, 108 Front St., 143 West St., and 1218 Broadway, 481 Broome St., 307 Pearl St.

THE NONPAREIL TELEGRAPH APPARATUS,

NEW AND IMPROVED, WITH STRAIGHT LEVER KEY.



FOR AMATEURS, STUDENTS AND SHORT LINES.

This popular Pioneer Cheap Telegraph Instrument has recently been improved and a Straight Lever Key placed upon it, which makes it as yearly perfect as possible.

Since its introduction over 2,000 of them have been sold, and it is still the leading telegraphic apparatus of its class.

They are furnished at the following popular prices:

Table of prices: Single Instruments with three cells of Battery, Chemicals, Connecting Wire and Instruction Book, \$6.50; Two sets of Instruments, etc., 12.00.

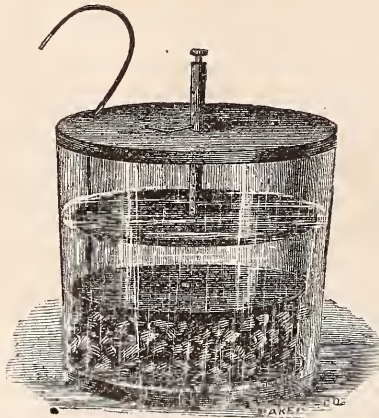
Send for our new Circular and Price List.

F. L. POPE & CO., 38 Vesey street, N. Y.

(P. O. Box 5503.)

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, - - - - - \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO., 41 THIRD AVENUE, Chicago, Ill.

PARTRICK, BUNNELL & CO., 38 SOUTH 4th ST., PHILA., AND 22 DEY ST., NEW YORK,

MANUFACTURERS OF

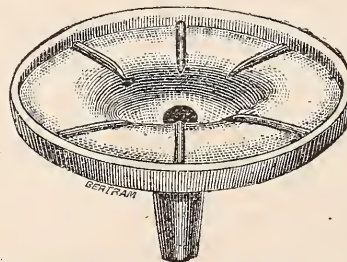
UNRIVALLED MORSE INSTRUMENTS

CHAMPION LEARNERS' APPARATUS, with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS, Improved Curved Keys, Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

GOOD NEWS FOR TELEGRAPH STUDENTS.

An Instrument has been invented, which is now offered for sale—prices within the reach of all—enabling both young and old to become proficient at a minimum expense. The beauty and finish delights all. The sound is perfect, and only needs an inspection to assure the idea of perfection of the invention.

Table listing instrument prices: No. 1. Instrument, with Alphabet, .25 cents; No. 2. " " " " 50 " " 60 " " " rubber knobs, .75 " "

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BROOKLYN, N. Y.

ANNOUNCEMENT!

Messrs. PARTRICK, BUNNELL & CO.

hereby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

—AT—

22 DEY STREET, NEW YORK,

where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL

AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in

CHAMPION LEARNERS' INSTRUMENTS,

NEW GIANT SOUNDERS, PERFECTED,

IMPROVED CURVED KEYS,

ELECTRIC BELLS, IN GREAT VARIETY,

NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED

LIGHTNING ARRESTERS,

LATEST AND BEST FORMS OF GRAVITY BATTERIES.

Together with LINE WIRE,

OFFICE WIRE, BRACKETS,

INSULATORS, LINE TOOLS, Etc.

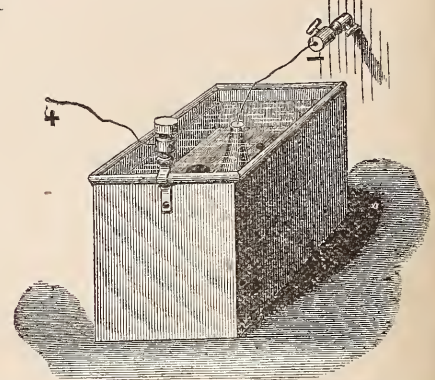
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PARTRICK, BUNNELL & CO.,

22 DEY STREET, NEW YORK.

38 South Fourth Street, Philadelphia.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

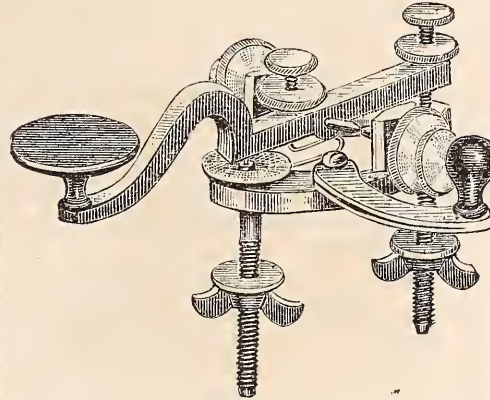
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WATTS & CO.,
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PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out. Acknowledged to be a decided improvement. Price, same as the ordinary key. Superintendents and Purchasing Agents are invited to examine our EXTENSIVE FACILITIES for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments. Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

THE BEST TELEGRAPH MATERIAL IN THE WORLD AT THE LOWEST PRICES!

The prices on our Catalogue are very low, but we are offering 20 per cent. discount from them on all Telegraph Instruments of our manufacture.

L. G. TILLOTSON & CO.,
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THE "SNAPPER" SOUNDER.



NEW STYLES, NEW PRICES.

TRADE MARK "SNAPPER,"
PATENTED MAY 12, 1874.

The unexpected and growing demand for the original "Snapper" Sounder, beyond the expectations of the manufacturers, has delayed the introduction of proposed styles and improvements.

Having increased our facilities and accumulated sufficient stock to enable us to fill orders promptly, the following varieties are now offered for sale at prices which will accommodate all classes.

- The "Snapper" Sounder, plain.....30c. 6 for \$1.50.
- " " " nickel plated spring... 0.40.
- " " " or 6 for..... 1.80.

A few were manufactured to order with hard rubber knobs. They were so well liked that I have decided to introduce them to the fraternity. The springs are secured by two screws, and, should they break, may be replaced at an expense of 15 cents. They are thoroughly made and finished.

PRICE,  75 CENTS.

To the Dominion 5 cents each extra.
A liberal discount to agents.

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Agents for New York City.

SMITH & HALL,
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GEO. H. BLISS & CO.,
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TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
- RELAY, SOUNDER and KEY on same base, making an elegant set.
- WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
- HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

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- HILL'S and the EAGLE BATTERY,
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- ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK, and AWL CLIP.

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 - HAND VICES,
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- SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

- TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.

- SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.
Bliss' Manual and Price List furnished free on application.

GEO. H. BLISS & CO.,
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BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY** THE **BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

L. G. TILLOTSON & CO,

8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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General Agent and Superintendent.

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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
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Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

QUICK SALES, SMALL PROFITS AND SUPERIOR GOODS.

We are offering any of our unequalled Telegraph Instruments at 20 per cent. discount from list prices.

L. G. TILLOTSON & CO.,
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NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor.

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single DANIELL cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made.

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street, PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.
Favorable arrangements will be made with line constructors, telegraph employés, &c., for the introduction of the Printer.
For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

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A AMERICAN COMPOUND TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.
CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.
Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

EFFICIENCY AND RELIABILITY.

Address—
American Compound Telegraph Wire Co.,
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MAGNETO-ELECTRIC ALPHABETICAL DIAL TELEGRAPH,
FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

MANUFACTURED BY
HOWARD WATCH AND CLOCK CO.
E. HOWARD, & CO., Proprietors.
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OFFICES:
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15 MAIDEN LANE, NEW YORK.

This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH
in the world.

It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up

THE ELECTRO-MAGNETIC WATCH CLOCK,
which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS

of all kinds,
CHRONOGRAPHS,
ASTRONOMICAL CLOCKS,
REGULATORS,
ETC., ETC.,
OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

F. L. POPE & CO.,
MANUFACTURERS AND DEALERS IN
TELEGRAPH INSTRUMENTS AND SUPPLIES
OF
EVERY DESCRIPTION,
38 VESEY STREET, New York.

NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

RELAYS,
SOUNDERS,
REGISTERS and KEYS.

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.

Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

BRADLEY'S BOX RELAYS AND SOUNDERS.

BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

Send for New Catalogue and Price List.

F. L. POPE & CO.,
(P. O. Box 5503.) **38 VESEY STREET.**

LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of

THE TELEGRAPHIC MANUAL,

by Mr. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

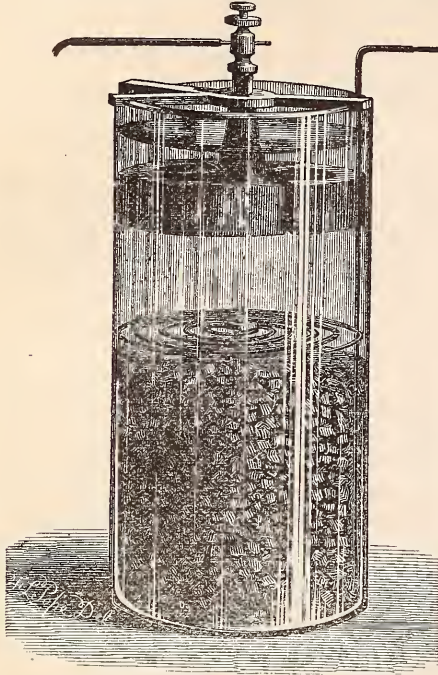
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description.
This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is ABSOLUTELY UNIFORM at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

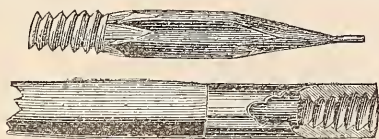
L. G. TILLOTSON & CO.
8 DEY STREET, NEW YORK,
SOLE AGENTS.

NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.
W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

ANSON STAGER, ELISHA GRAY, ENOS M. BARTON,
Pres't. Sup't. Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

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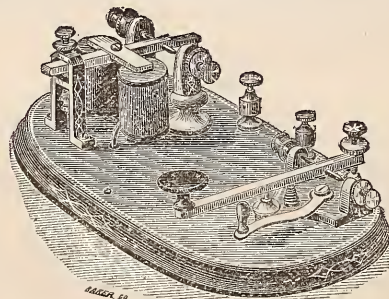
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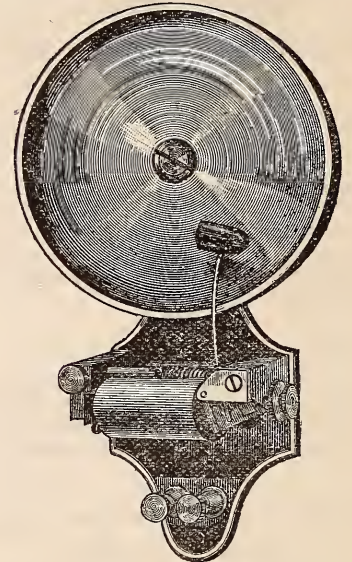


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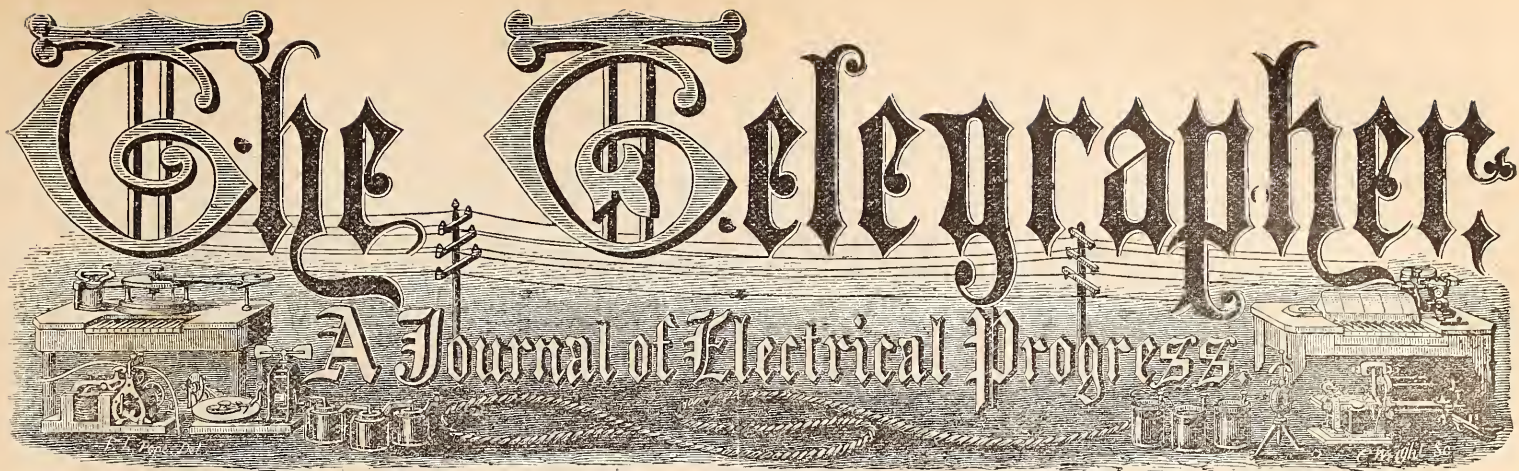
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A Journal of Electrical Progress



Vol. X. New York, Saturday, June 27, 1874. Whole No. 415

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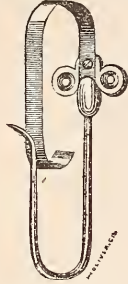
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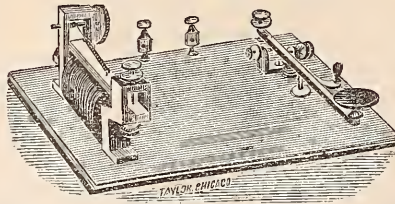
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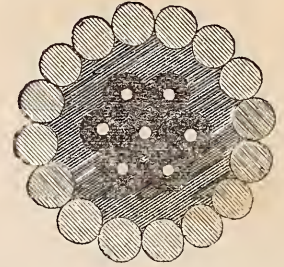
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JUNE 27, 1874.

VOL. X.

WHOLE No. 415.

Downey's Lament.

If I say it meself, shure an' its no flattbery,
I do try and make out to kape a clane batthryer;
But there's some of those fellers that works those way wires
Talks about "locals" in a way I admires.

Now, luek at these William's by's, Lord bless your sowl,
Don't know a good local from a bricklayer's trowel;
But they come to me mornin's wid "Mike, luek ye here!
Could a man take from this, lest he had a tin ear?"

I luek to the local, an' fot does yez think—
Faith, there's nary corode on the copper nor zinc;
There's nothin' at all to cra-ate any bother,
And jars and the porous cups well filled with wather.

Av course, I'm expected the batthryers to clane,
And fot should I know if their local mashaue
Was broken, or had olms, or divil knows fot;
But them by's are the ones to make me red hot.

Well, the only thing I do to get me relafe
Is to skip all those way wires and call on the chafe;
And when he's not busy or too badly rusht,
He goes for thim, sayin', "why can't yez adjust?"

An' 'pon me owld sowl, fot I till yez is thrue,
A wake local's made sthrong by the turn av a skrew.
If agin for those by's ary local I scrub,
May I ne'er take out crasses agin wid a club.

So write 'em up lively, now, in the next Plug—
Yez can give 'em a fotograf too of their mug;
Yez can write it in prose, or vorse, if yez like,
And fen yez have finished it plase sign it

MIKE.

—The Plug.

[From *The Boston Journal of Chemistry*.]

The Telegraph in War.

THE important part which the modern system of electric telegraphing played in the late war in this country is but imperfectly understood. The field telegraph was in constant use during the entire four years, in both the Union and Confederate armies, and it directed the movements of advancing columns, flashed orders on battlefields, and sent commands from headquarters to right, centre and left of the immense lines which extended over miles of country. No modern general would enter upon a campaign without calling the lightning to his aid; it is now a recognized part of the material of war. Gliding on its secret path through the wide network of cable and wire, it tells him what is passing each hour in the remotest part of the theatre of war, and transmits the commands which decide the fate of nations. In all the more recent wars in Europe and in Africa the field telegraph was in constant use. A correspondent of the London *Popular Science Review* gives the following very interesting account of the same in a recent number of that journal:

It is just twenty years since, for the first time, the electric telegraph was used in the field, and to our own army belongs the honor of having led the way in its adoption. The trenches and batteries before Sebastopol were traversed and connected by lines of telegraph, and the French soon followed our example and constructed a similar system in their own lines—while later on a cable laid across the Black Sea put the armies in the field in direct communication with Paris and London. Since that time a regular telegraph corps has been organized in every European army. And the field telegraph was used by the French in Italy in 1859, and in their campaigns against the Kabyles in Algeria; and in America both the Federals and Confederates made free use of permanent and temporary lines during the War of Secession, the Southern cavalry, in particular, displaying great daring and enterprise in riding round the flanks of the Federal armies, seizing their telegraph lines, sending false messages to the Northern generals, and then cutting the line and retiring as rapidly and secretly as they came. It was, however, in the Prussian army, and in the great campaigns of 1864, 1866 and 1870-71 that military telegraphy attained its greatest development; and after the experience of these three wars, the Prussian telegraph corps is probably the most efficient in Europe.

The object of the field telegraph is to keep the headquarters of an army in communication with its several corps, and at the same time with the general telegraph system of the country. The line may be

either an aerial or a ground wire, or a combination of both, the former being stretched on poles, while the latter is insulated by being enclosed in a light cable, about half an inch thick, and laid along by the road sides or across the fields. The uninsulated wire and the cable are both issued to the telegraph corps coiled on small drums, several of which are carried by each store wagon. In those companies which are to erect a wire stretched on poles, the wagon carries five English miles of uninsulated galvanized iron wire, one mile insulated in gutta percha, 1,000 yards of the cable, and 200 poles with insulators attached, all the wire being coiled on twelve drums. If it is intended to lay a ground line, the wagon carries eleven drums of the cable, one of wire covered with a light coat of gutta percha and tarred hemp, and a few poles and insulators, for carrying the line across small hollows or raising it overhead in crossing roads. Beside these stores the wagon contains all the tools necessary for the work, and a light step-ladder is hung underneath it.

The line is very rapidly and easily constructed. In the case of a ground line it is simply paid out from the drums on the hand or wheelbarrow, being buried in a shallow trench or elevated on poles, when it is necessary to cross a road where the insulation of the cable might otherwise be injured by the wheels of passing vehicles. During the invasion of France, the Prussians frequently avoided the roads in order to protect the line from the *franc-tireurs*, and made considerable *detours*, concealing it in woods, ravines and watercourses. Where the uninsulated wire is used poles are erected about fifty paces apart, the hole to receive each pole being made by driving a sharp pointed iron bar into the ground with a heavy mallet. As soon as a pole is fixed the wire is run through the hook on the top of the insulator, and stretched tight by a man holding it over his shoulder, who keeps it in this position until the next pole is ready to receive it. Wherever there are trees or walls near the line, the work is still further lightened by dispensing with the poles, and merely attaching the wire to the insulators specially constructed for this purpose. In this way the line was erected for the Ashantee expedition, the negro laborers carrying only a light ladder to ascend the trees, a small axe to clear away the boughs, and a gimlet to make the hole for the spindle of the insulator. It never took, we are informed, more than five minutes to fix an insulator to a tree; but in those few places where trees were not available, fully half an hour was occupied in erecting each pole, and even then it was often unsteady and had to be propped and guyed.

In Europe, where there is an extensive telegraph system in operation in every country, there is no need of the field telegraph lines extending from the front of the army to the base of operations. Far less than this is required. All that is necessary is to connect the headquarters of the army with the nearest point on a permanent telegraph line, and in most European countries an army in the field would seldom, if ever, be more than ten miles from such a line. Ten miles of the field telegraph can easily be erected in half a day; indeed, the Austrian engineers assert that on favorable ground they could do the work in two hours. In most cases, of course, the advancing army would have to repair the permanent lines which would be partially destroyed by the retreating forces, and in this way twenty-five miles of wire were often erected by the Prussians in a single day. As soon as an army moves forward, the field telegraph line previously erected is taken down and recoiled on the drums, while a fresh line is laid from the new headquarters to the nearest permanent telegraph. This is done with a view to economizing the material, an enormous amount of which would have to be carried with the army, if the lines it left behind it in its advance were not removed, and the poles, wire and insulators employed in their construction again utilized. The hand barrows of the Austrian telegraph corps are designed to be used in recoiling as well as uncoiling the wire, and for this purpose are fitted with a crank handle and ratchet wheels, so as to enable a man to turn the drum and wind the cable upon it.

Besides the ordinary field telegraph companies, the French army includes a mountain telegraph corps, organized with a view to operations on the mountainous frontiers of the south, or to be ready to carry a line over a range of hills in an ordinary campaign, thus avoiding a long *detour* in the valleys, or securing lateral communication with troops divided from the main army by the hills. As the mountain line would have to be laid along narrow rocky paths, and through lofty passes, all carriages and wagons are dispensed with, and their place is taken by a train of mules. In a mountain telegraph company several of the mules are each laden with two drums of the insulated cable, the instruments and batteries are carried on pack saddles on the back of others, and others again transport the baggage, provisions and forage of the company, and also a light tent, to form a station whenever messages are to be sent along the line.

While the field telegraph affords a commander a rapid and certain medium of communication with his

base of operations and the various corps of his army, it must be remembered that it is one which is continually liable to interruption by an enterprising enemy. Wherever a general has to contend with an army well provided with good cavalry, he will find it extremely difficult to protect his telegraph lines from being destroyed by daring raids of his opponents. There are several easy ways of making a telegraph line temporarily useless. The simplest and most obvious method is to pull down the poles and cut the wires into pieces; but when this is done the damage is easily detected, and the repairs at once commenced. The interruption will, therefore, be far more serious if it can be effected in a way which will not permit of its exact locality being so readily discovered. This can be done by cutting the wire, introducing a piece of gutta percha or any other non-conducting substance into the course of the circuit, and connecting the ends of the wire with it, so as to give it the appearance of one of the ordinary joints or splices of the line. At the same time a few poles can be pulled down in another place, and the wires cut, and the probability is that the engineers who repair the line will not discover the hidden interruption of the circuit until after they have restored the gap, and found that the wire is still cut somewhere else, and even then the place where the non-conducting substance is introduced will not be discovered until some time has been employed in carefully testing the line with the galvanometer.

But there are other dangers to telegraphic communication in the field besides the mere damage to the line. If the enemy's cavalry get possession of a station they can easily send messages containing false information or delusive orders to well known officers of the opposing force, while the place from which they are sent and the assumed name in which they are despatched, will give the messages an appearance of authenticity which, if it does not completely deceive the recipient, will at least be the cause of considerable doubt and perplexity to him, and, perhaps, make him hesitate to accept the accurate information or authentic orders received from other sources. Again—even without occupying a station it is possible to read the messages which are passing along a telegraph line, and thus perhaps discover important secrets. All that is required for this purpose is a small portable receiving instrument and a few yards of copper wire to connect it with the line. A single individual thus equipped can "tap" a telegraph line in the daytime by receiving the message in the ordinary way; and at night (when, of course, it would be easier to approach the line) by listening to the clicking of the armature against the electro-magnet of the instrument. But all these dangers are only of a partial or temporary character. By carefully patrolling and testing the line it cannot be interrupted for any length of time without the damage being observed and repaired. By adopting a secret arrangement that there shall be a certain number of letters in the two or three words at the beginning or end of every message, a despatch sent by an enemy can in most cases be detected. And, again, by employing a cipher alphabet, it will be difficult for any one who taps the line to obtain information from the messages which fall into his hands.

From this brief sketch of the structure and uses of the field telegraph the reader will understand what an important part it plays in modern war.

Line Repairing in Queensland.

THE following account of the perils by flood and field of a Queensland telegraph station master, during the late very rough weather in the North, has been furnished the *Brisbane Courier*:

About twelve o'clock on the 22d of January we lost circuit on the St. Lawrence side. The rain was falling in torrents, and trees were being rooted up by the wind and carried away in every direction. However, there was no help for it—I had to go. I reached the Denison Creek at dark, where I camped, the words "wet through" conveying but a faint idea of the state I was in—matches and everything else floating about in my pockets and saddle bags, so that a fire was out of the question. There I stayed all night, and it rained without intermission the whole time. In the morning the creek was running bank high, and trunks of trees floated past me very often. After considering a while, I resolved to strip, unsaddle my horses, and try with one barebacked. In I plunged and away went the horse, swimming beautifully down the stream, faster than ever I saw anything but steam go before. We reached the opposite bank successfully, but some little distance below where we went in. I then rode, just as I was, to Funnel Creek, a distance of ten miles, to see if the break was between the two creeks, which I felt sure was the case, but not so. On reaching Funnel Creek I found it over the banks, the roaring of the waters, and the amount of drift being something frightful. To think of crossing would be madness, so I retraced my steps to Denison Creek, where I had left my pack horse and equipment, but, being unable to re-

cross it, I remained where I was in the pelting rain all night and till noon next day. Things then becoming serious I fully determined to try it at all risks, so plunged in again, and as my horse had had a good spell, and was desirous of regaining his mate, he swam splendidly and regained "de oder shore." I remained there that day just to recruit myself, and then tackled it again with both horses and equipment, crossed successfully, and remained at the creek for the night. Next morning stripped, and taking my best horse, with the saddle and as few tools as possible, again made the attempt to cross Funnel Creek. I had, however, been too sanguine, for I had hardly got fifty yards into the stream, or about one third the way across, when horse and myself were rolling over and over like corks in the boiling water. I was beginning to feel the water gurgling in my throat when I got free of my horse, and shortly after went bump against a tree, which I instinctively clutched, pulled myself up to the surface, and straddled across a branch. On casting my eyes up stream I saw my horse caught against another tree, but with his legs uppermost, so I gave him up for lost, and was just turning my eyes away when he gave a struggle, freed himself, and floated in my direction.

As he came past I made a grab and caught him in the ring of the bridle, and succeeded in pulling him up, and held him till I was quite exhausted, and then let him go, when he struck out and reached the bank a quarter of a mile below where he went in. The blood was now running from my nose and ears, and I felt a dizziness coming over me, so moved higher up the tree, and having fortunately taken the precaution to have a strap holding a knife, pipe, pouch and tobacco with me, I strapped myself firmly to it. I suppose I fainted, for when I found myself again the sun was over the yard-arm, so I must have been there several hours, having started at daylight. I felt very weak, and my back and legs were literally skinned with the sun; so I lowered myself down into the water, and again strapped myself on with my head and shoulders just above the surface. A log coming on sideways soon made me shift out of that, and I got up as high among the leaves as possible, and made a covering for my head with twigs and leaves. Feeling desirous of a smoke, I fished some matches out of a Leichardt bean, stuck them in my whiskers to dry, which they soon did, and so managed to luxuriate in a smoke. Towards evening I began to feel hungry, and to add to my uneasiness, the creek, instead of falling, kept rising slowly. I determined to vacate my seat; so, getting on to a limb about three feet from the water, I made a dive head first in. When I came to the surface I found myself about five yards from the tree, nearer the bank, but about twenty yards below it. I now struck out for my very life, and down, down I went, not seeming to get a bit nearer the bank, until I came to a turn in the creek, where I made a great effort and managed to reach the edge and touch bottom with my feet. In the meantime the native police had been sent out after me, and the *Copperfield Miner* had a report in its columns that I had been drowned. I returned to my station, started again next day, and camped at the creek. A man was sent with provisions for me and orders to return; this I declined to do, and before the men left me had another try, but my horse knew too much for me, so I tried the pack horse. He, however, only got into swimming water when he jibbed on it, turning short round, and in doing so upsetting himself and me, I losing in this attempt a saddle and clothes. I then sent the man back with a request for two black boys, who came down two days after; and at the seventh attempt I got across the creeks safely, finding seven breaks on the line and thirty-five insulators carried away.—*Melbourne Argus*.

The Telegraph in Central America.

NOTWITHSTANDING the many difficulties which have had to be overcome, the telegraph has made considerable progress, and is still being pushed forward as energetically as possible in the States of Central America. The State of San Salvador has been the most prominent in this work, and the telegraph lines already connect many of its principal places, and are being constantly further extended. The lines are also being continued to connect that State with the adjoining States, and within a short time the line to Guatemala will be completed; and the construction of a line connecting San Salvador with Comayagua, the capital of Honduras, will soon be commenced.

From a communication, or report, by Mr. A. Maury, the Superintendent of the Salvadorian telegraphs, to the Government, made at the commencement of the present year, which has been translated for THE TELEGRAPHER, an interesting account of the telegraphs in that State, and the difficulties which have been encountered and overcome, and which are yet experienced, are given. The Central and South American telegraphs are owned and operated by the governments of the several States and countries, and are more ex-

tensively used for Government purposes than for private correspondence, though they are all open to private use, and the patronage for commercial and social messages is increasing as the system is extended and developed, and the public become accustomed to the use of telegraphic facilities.

The interesting report of Mr. Maury alludes, in opening, to the creditable fact that the Republic of San Salvador took the lead of her sister States in the introduction of the telegraph, and to the obstacles with which she had to struggle, arising from the elements, financial embarrassments, and the ignorant superstition of her rustic population, and says: "From the City of Salvador in every direction the traveller beholds, bordering the roads and spanning the wide-spread plains, the mystic thread that places in immediate communication the most widely separated regions. * * * * Such is the admirable work that, almost from the commencement of its construction in this country, and particularly in its organization as it exists to-day, I have had the fortune to direct—sharing in all the difficulties of its construction as in all its triumphs over material obstacles, as well as over the mistaken malevolence of its credulous enemies, until I behold it almost perfect itself, and come to be an indispensable power in the life of the people; and I feel a glow of satisfaction and pride as I witness each day its increasing estimation and its general utility among all classes of our population."

After referring to the good faith of the employés, to whom are necessarily entrusted the most important secrets and confidences in regard to private and government affairs, he alludes to the increasing appreciation of the telegraph on the part of the municipal authorities and the people of the towns and cities of the Republic, who, for the sake of securing its introduction, undertake the cost of its construction and maintenance. In this manner have been added to the list of stations the towns of Quezaltipeque, Cotepeque, Yzalco, Atiquesaya, Tucuopa and Metopan.

"Guatemala stretches out her hand towards us, and the wire issuing from her centre will come, early, I trust, in the ensuing season, to connect with ours, binding more closely the ties of friendship and welding the chain of fraternity between the two neighboring Republics. Thus the impulse given ever advances, and each step leads onward to ultimate perfection."

The receipts of the Salvador telegraphs do not pay the cost of maintenance and operation, though they are increasing satisfactorily; but taking into account the Government messages transmitted—which, if charged for at regular rates, would amount to a large sum—the lines are not only self-supporting but pay a handsome profit on the capital invested.

On the 20th of December, 1869, the Supreme Government made a contract with Mr. Charles H. Billings, an American, for the construction of the first line of telegraph between the capital and the port of La Libertad. Having procured the necessary material Mr. Billings began the work on the first of March following, inaugurating the first office in La Libertad on the 27th of April, 1870, and that of Santa Tecla on the 20th of June following. "On the 30th of May the contract for the Western line was signed, on which the first telegram that passed along the wires was transmitted from Nejapa to this city on the 20th of October, and successively were opened the offices of Apico the 15th, Cotepeque the 16th, and Santa Ana the 18th of the following December, concluding with that of Acajutla the 6th of February, 1871; the work having lasted nearly a year, in which interval a sufficient number of youths of the country were instructed in the telegraphic art so as to carry on the business of the rising stations.

Afterwards the Provisional Government of Marshal Gonzales, penetrated with the importance and utility of the movement, signed a contract with Mr. Stanley McNider for the eastern lines, with offices at Suchitoto, Chalatenango, Ylobasco, Sensentepeque, Cojutepeque, San Vicente, Zacatecoluca, Usulután, Chinameca, San Miguel and La Unión—which last office was opened on June 18th, 1872.

It being found very difficult to maintain this line—which followed the cart road from Zacatecoluca, crossing the river Zempa at its widest part, and traversed extensive forests, where falling trees constantly interfered with the wires, the route being almost uninhabited—a new contract was made, June 8, with Mr. McNider, for the building of a direct line between Chinameca and San Vicente, which was commenced on the first of July following, under the direction of Mr. Maury. To avoid the dense forests and uninhabited districts it was proposed to construct this line through the open plains and valleys to the north of the volcano of Signatepeque, but on arriving at the margin of the Zempa, with the wire run on the 19th of that month, he was obliged to suspend operations on account of the opposition of the Governor of San Vicente. Finally, the Government not appreciating the inconveniences and difficulties of maintaining the lines, which have since become so evident, decided, against the opinion of the contractor, upon another route, which occasioned three months' delay in the construction of the

line, and increased the cost and subjected it to the same difficulties and disadvantages before mentioned.

The inhabitants of several towns and cities, eager to possess the advantages of telegraphic communication, offered to take upon themselves the expenses of construction and operation, which resulted in an extension of the lines of seventy-nine leagues, which brings all those places in instantaneous communication with the capital and the rest of the Republic. In the east there is less enterprise; "for, notwithstanding there are in these districts ninety-six leagues of wire with twelve stations, there still exist wide spaces without any communication, where apathy reigns undisturbed although it has many large populations; they do not aspire to facilities they have not known.

From what has been said, it can be seen that the three ports of the Republic and the three frontier garrisons are in such close relations with the centre, that a few moments is sufficient to ask for and obtain information at any desired time, and the same may be said of all the interesting points of the State.

The total cost of these lines aggregates \$83,360.37. The total annual expense of operating and maintaining the system is estimated at \$21,200. The revenue derived from correspondence is about \$900 monthly—an annual aggregate of \$10,800—which leaves a deficit of \$10,400. This does not include any amount for the official use of the wires, which is much larger than (Mr. Maury estimates it at four times) the private business.

The remainder of the report is occupied with details of accounts, defects of organization, and the necessity for more executive authority being vested in the Director or Superintendent of the system.

The Survey for the Pacific Cable.

THE U. S. steamer *Tuscarora*, engaged in soundings for the Pacific Cable, arrived at Yokohama, Japan, April 22d, after a passage of thirty-four days from Honolulu, Sandwich Islands, *via* Port Lloyd, Bonin Islands. The survey of the Southern route, from San Diego, California, to Yokohama, *via* the Sandwich Islands, is now complete. The result of the first portion of the survey, from San Diego to Honolulu, has already been printed in THE TELEGRAPHER. We gather from the report of Commander Belknap to the Navy Department that the weather, after leaving Honolulu, was generally very favorable for the work, and that seventy-three casts were made, the deepest being 3,287 fathoms, at which depth the working of the patent reel of Sir William Thomson and the piano wire was as admirable and satisfactory as ever. At that great depth a person standing on the topgallant forecastle, and watching the muning out of the wire from the reel in the gangway, could tell the moment bottom was reached.

A glance at the profile charts shows that after the ocean bed proper is reached, near San Diego, the bed descends in comparatively gentle curves and undulations to the vicinity of the Hawaiian Islands, where a depth of 3,054 fathoms is found; thence, westward, the bed slowly drops till the lead reaches down to 3,287 fathoms, or about three and three quarters statute miles, in the neighborhood of the Bonin group.

But while the bed is comparatively regular, and the character of its soil nearly uniform between San Diego and Honolulu, a range of submarine mountains is found to exist between the Hawaiian and Bonin groups, with soil of varying character, the valleys sending up light yellow-brown ooze or mud in the specimen cups, and the sides and tops of the mountains coral, limestone and sand, with fragments of lava. In three or four instances, too, solid rock was struck, the cups coming up empty and the points freshly hattered. In others the ooze from the plateaus was found to contain particles and fragments of lava; and, in one specimen brought up, sixty miles from the base of one of the submarine peaks, quite a lump of the same material was found. Coral, sand and lava, is also found all the way from the Bonin group to the coast of Japan, and, in short, the entire region west of the Hawaiian Islands would seem to have been subjected, at some remote period, to volcanic disturbances.

Six of these submarine mountains were discovered, ranging from 7,000 feet to 12,600 feet in height, and Marcus Island, which rises scarcely more than from thirty to sixty feet above the surface, lies directly in this range. A cast some eight miles from that island gave a depth of 1,499 fathoms, coral and lava bottom, and the high, wide white beach, occasionally broken with large, black, volcanic looking rocks, presented the same dazzling white appearance characteristic of the beaches on the shores of the Bonin group—and those beaches are all composed of broken coral. Hence, it may not be unreasonable to suppose that Marcus Island forms the apex of a volcanic cone or island, perhaps, in ages past, much higher than now. A thick growth of trees crowns the island, and myriads of birds were flying over and around it.

The ocean bed between the Bonin and the entrance of Jeddo Bay is irregular, as might have been sup-

posed, from the almost continuous chain of islands lying nearly parallel to the route sounded. The deepest water found was 2,435 fathoms, and the next deepest 1,669 fathoms.

Should a cable ever be laid by this southern route, a good place to land it in Port Lloyd would be in or near the ten-fathom hole.

Poetry of Telegraph Poles.

WHAT a receipt for preserving wood—to fill its pores with music! How this wild tree from the forest, stripped of its bark and set up here, rejoices to transmit this music!

When no melody proceeds from the wire I hear the hum within the entrails of the wood, the oracular tree, rejoicing, accumulating the prophetic fury. The resounding wood, how much the ancients would have made of it!

To have had a harp on so great a scale, girdling the very earth, and played on by the winds of every latitude and longitude, and that harp were (so to speak) the manifest blessing of heaven on a work of man. Shall we not now add a tenth muse to those immortal nine, and consider that this invention was most divinely honored and distinguished, upon which the muse has condescended to smile—this magic medium of communication to mankind?

To read that the ancients stretched a wire round the earth, attaching it to trees of the forest, on which they sent messages by one named Electricity—father of Lightning and Magnetism, swifter far than Mercury—the stern command of war and news of peace; and that the winds caused this wire to vibrate so that it emitted harp-like and Æolian music in all the lands through which it passed, as if to express the satisfaction of God in the invention! And this is fact, and yet we have attributed the instrument to no god.

I hear the sound of the wood working terribly within. When I put my ear to it, anon it swells into a clear tone, which seems to concentrate in the core of the tree, for all the sound seems to proceed from the wood. It is as if you entered some world cathedral, resounding to some vast organ. The fibres of all things have their tension, and are strained like the strings of a lyre. I feel the very ground tremble underneath my feet as I stand near the post. The wire vibrates with great force, as if it would strain and rend the wood. What an awful and fatal music it must be to the worms in the wood! No better vermifuge were needed. As the wood of an old Cremona, its every fibre, perchance, harmoniously tempered, and educated to resound melody, has brought a great price—so, methinks, these telegraph posts should bear a great price with musical instrument makers. It is prepared to be the material of harps for ages to come—as it were, put a-soak, a-seasoning in music.—*Thorau.*

Miscellaneous.

ELECTRO-PLATING WITH COBALT.—The following process of George W. Beardslee, of Brooklyn, N. Y., is stated to form a thick and useful covering, which will very perfectly protect the plated surface from the action of the elements, and form a most beautiful plating, very white, exceedingly hard and durable, tenaciously adherent, and not liable to tarnish: “Dissolve the pure metal cobalt in boiling muriatic acid, and evaporate this solution to dryness. Then dissolve from four to six ounces of the salt thus obtained in a gallon of distilled water, to which add ammonia sufficient to show on test paper the solution just slightly alkaline. Then prepare an anode of the metal cobalt, in granular form or broken into small pieces, free from impurities, as follows: Take a plate of carbon, or of some other material that is a conductor of electricity, but not susceptible of being attacked by the plating solution, and place it within a sack or envelope made of some material that is neither a conductor of electricity nor attackable by the solution, formed with open meshes or interstices through which the solution may freely circulate. This envelope should be made to conform in shape to the carbon plate, and large enough to leave a space between it and the plate of, say one half an inch to one inch; then fill this space with the granules of cobalt, which will, as is evident, surround the plate and be in contact with it. By an anode thus constructed a large surface of the cobalt is readily and conveniently exposed to the action of the solvent, and the steady flow of the entire battery current through the cobalt is secured, thereby rendering the dissolution and deposition of the metal steady, uniform and very perfect. This anode is to be connected with the copper pole of the battery by connecting the wire to the carbon plate and suspending it in the plating solution before described, and the article to be plated is connected in the solution with the zinc pole in the usual way. A battery power of from two to five cells (Smee’s battery) will be sufficient to do good work. Care should be taken not to permit the solution to lose its slightly alkaline charac-

ter, as, if this is not maintained, the plating operation will be rendered imperfect, the tenacity, adherence and uniformity of the deposit becoming thereby impaired.—*Scientific American.*

GAS PRESSURE ALARM.—When two neighboring buildings are illuminated by gas derived from the same source it frequently happens that the extinction of the lights in one building causes the pressure of gas in the other to become greatly increased, and sometimes to result in accident. M. Launay proposes, as an alarm to give warning of this over pressure, a bisulphate of mercury battery, in which the liquid is in communication with the gas by means of a siphon, so that the pressure of the gas, in varying, raises or lowers its level. If the pressure is above a certain fixed limit, the liquid is raised so as to come in contact with the metallic portion of the battery, establishing a current which sounds an electric alarm. M. Launay also suggests that a simple method of determining leaks in gas pipes throughout a building is to force some strongly odorous smoke into the supply pipe. The fumes of incense, for example, escaping in any room, would be readily distinguished from gas, and the locality of the leak discovered.

GALVANIC ELECTRICITY WITHOUT CHEMICAL ACTION.—At a recent meeting of the Physical Society Mr. Fleming showed his new battery, in which the metallic contact of dissimilar metals is entirely avoided. The arrangement consists of thirty-six test tubes of dilute nitric acid, and the same number of tubes of sodium pentasulphide, all well insulated, alternating with one another. But strips of alternate lead and copper connect the neighboring tubes, by which means the terminals are of similar metal, and a current of sufficient intensity to violently affect a quantity galvanometer obtained. The potential increases, as in the ordinary galvanic arrangement, with the number of cells employed, until sixty cells showed an electromotive force exceeding that of the same number of Daniell’s elements. In this new battery the acid lead is positive to copper, while in the sulphide it is negative. Mr. Fleming further showed how, by using the single fluid nitric acid, and the single metal iron, a similar battery could be constructed, provided one half of each iron strip was rendered passive. This is an important discovery, for it seems to revive the theory that chemical action is not necessary in a galvanic apparatus to produce electricity. At all events, it is of sufficient interest to merit the sound inquiry into its principles which physicists seem likely to make.

SOCIETY OF ARTS.—The Albert Gold Medal of this society, instituted to reward distinguished merit in promotion of arts, manufactures and commerce, has been awarded for the present year to C. W. Siemens, D. C. L., F. R. S., “For his researches in connection with the laws of heat, and the practical application of them to furnaces and the arts; and for his improvements in the manufacture of iron; and, generally, for the services rendered by him in connection with the economization of fuel in its various applications to manufactures and the arts.”

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

A Lady who Tolerates the Use of Tobacco.

TO THE EDITOR OF THE TELEGRAPHER.

HAVING read the communication in your issue of the 6th inst., in “defence of tobacco and tobacco smoking telegraphers,” over the signature of “Tom,” I feel inclined to say a few words on the subject. I think he is mistaken when he says that “ladies dislike segars.” I for one must acknowledge that I really like the smell of a good segar in its proper place—in the open air; although I consider smoking an expensive, often unpleasant to others, and an utterly useless habit. True, your correspondent says it acts as a sedative when not taken to excess, but the worst of it is there are so few gentlemen who do not to such an excess that the effect is anything but sedative.

I agree with “Tom” that the ladies would do much better if they would “try and overcome their dislike to this fragrant narcotic.” Now, sisters all, try and learn to overcome your dislike to this pet habit of your brothers, husbands and lovers; for, be assured that if they are once convinced that we really like their pipes and segars, they will soon give them up of their own accord—will you not, young men? Don’t all speak at once. In conclusion, I don’t think “Tom” speaks his heartfelt opinion when he says what he does about getting married, for people who say such things are generally the very ones who don’t think them. But per-

haps he does, since, as he confesses, that he is contented with a segar in the place of a young lady, whose company he might have by going only three miles for it. My friend, I am afraid you are inclined to be indolent. ELINOR.

A Matrimonial Epidemic Among the Oregon Telegraphers.

ALBANY, OREGON, June 15.

TO THE EDITOR OF THE TELEGRAPHER.

NANITCH mika ticka nika? Hyas close wawa: waka halo ciosa nika. Hoopla! Set ’em up again. Whoopee!

I am a victim of a series of the most diabolical conspiracies ever known. Some time since, in a fit of recklessness, I volunteered, or rather agreed to furnish a suitable obituary for THE TELEGRAPHER of every Oregon telegraphic artist that ceased to lead the life of a bachelor, not for a moment supposing that any one of them would have the moral courage to go through all the tribulations requisite to avail themselves of my proposition. But, “’Twas ever thus,” etc.; a series of painful surprises awaited me. One by one, and sometimes two by two they have dropped out, until to-day (my experience has made me cautious about speaking with confidence of anything beyond the present moment), out of sixteen to whom that offer was extended, there remain but four who have not availed themselves of it, by becoming steady Benedicts! And what has caused this outburst of indignation is the presumption, impudence, or whatever you may call it, of Wheeler, of Shedd’s office, coming to our city and carrying away as his bride one of the belles of this hitherto famed place; and right on top of that comes to me the intelligence that one who mastered the art of the dots and science of the dashes under me is on the eve of leading a fair damsel to the altar!

I have been doing a little figuring, and the result is as follows: 12 from 16 leaves 4; 1 from 4 leaves 3; and at this rate 3 from 3 leaves—what?

Query.—If the same energy were displayed by every single person in this State that has been shown by the railroad telegraphers in regard to getting married, how long would it be before the bachelors and “old maids” would become extinct in Oregon?

But these thoughts perplex me too much, and I will have to “disconnect” and get ready for two more “splices,” when I hope to get a “breeze,” and there will be a rest for, that will be enjoyed by

WEEFOOT.

Wanted—A Dictionary.

BOSTON, June 23.

TO THE EDITOR OF THE TELEGRAPHER.

“By gorry that sticks me!” was my first thought after reading in the *Journal of the Telegraph* of June 15th an editorial advertisement with this title, viz: “Wanted—A Character.”

I am not so much surprised at this strange necessity as I am at the profound attempt of the editor near the close of his advertisement, where he says the applicant for position must “bear the alembic of a higher standard.”

Alembic is good! Alembic ought to be promulgated! My first exclamation, when perusing this alembic qualification, was that this editor had got beyond his depth—that he was trying to indulge in some phantas magorical expression, but without a definite idea.

With almost unbecoming jest and merriment I repeated, “Alembic is good!” I took down my unabridged and went for alembic. Much to my surprise I saw that alembic meant “A chemical vessel used in distillation, the beak of which is fitted to the neck of a receiver.”

Here then was a clear and satisfactory explanation of the cabalistic word. The editor evidently intended that as his company manufactured most of its supplies, and as its operators required an artificial stimulus, that applicants should bring an improved whiskey still, and that the beak of which should be fitted to the neck of the receiver—that is, to the neck of the operator and clerk receiving messages. Now, as this is the only meaning of the word, this must be the correct interpretation of the editor’s idea—if indeed he had one—and, with considerable unction, I again repeated, “Alembic is good!”

Now, I think of calling on this editorial Don Quixote and shall bring my alembic with me. It is one of the best alembics in this country, and a first class giascutus and lipitadino both go with it; and I shall be pleased to attach my apparatus to the neck of this learned editor, that he may be convinced of its practical superiority.

Once more I repeat, “Alembic is good!” O. K.

A TEXAS man recently declined to receive a telegraphic despatch from a yellow fever locality lest he might catch the disease,

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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WE have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

The Season and its Consequences.

THE summer, which has been so long delayed, has unmistakably come at last, as the intense heat which has prevailed during the past week has assuredly demonstrated. We do not propose to inflict upon our readers a seasonable treatise upon the weather, or even to treat upon the atmospheric electrical demonstrations and exhibitions incident to the heated term, and by means of which electrical equilibrium is restored. These are trite and well worn topics, and we must confess to having fallen back upon them ourselves when hard up for subjects, as editorial writers not unfrequently are, and the atmospheric condition was such as to incapacitate from any serious mental labor. Our real object in alluding to the "heated term," which is upon us in all its calorific excess as we write, is to offer it as an excuse for any lack of interest which may be found either in the editorial or other columns of THE TELEGRAPHER. With the thermometer in the vicinity of 90 degrees, and every pore in the body exuding rivulets of perspiration, who can be wise, witty or instructive? Wisdom and instruction do not come by inspiration or intuition, but are the results of severe mental labor and practical experience; and who of us is capable of undergoing either under such atmospheric conditions? We have noticed, during the years in which it has been our lot to conduct this paper, that when the summer solstice has been fully inaugurated, and a high temperature and atmospheric electricity prevail, that most of the numerous correspondents of the paper give themselves a vacation, so far as writing for its columns is concerned, and that the subjects which interest them so much for nine months in the year that that portion of the paper which is devoted to their use is usually too circumscribed to accommodate their desire to discuss them, is scantily supplied with the productions of their pens. We cannot blame

them for this; for if we, whose business it is to write, find it so difficult at such a time, how can it be expected that those who write only from voluntary impulse, or because they desire to be heard in its columns, should afflict themselves, or afflict those who may read them, with their heated compositions? However, we trust that we shall not be entirely deserted by our regular contributors, and that they will, at least when a cool day or two may intervene, remember that the demand for "copy" is as great in hot weather as in cool, and lend us a helping hand and pen.

Many excuses have been offered for editorial dullness, but we think that of the heat is about the best, unless we should all be converted to unwonted candor, and acknowledge that it is natural and inherent, which we fear our readers may long ago have decided to be the case. However this may be, it is too hot for controversy, and each one has full liberty to think and decide as shall seem best to him or her, at least until cooler weather comes, and the year's crop of mosquitos has been gathered.

There are other beneficial effects of a heated season besides and beyond its effect upon the writers for the press. For instance, Congress, which a few weeks since was unable to agree upon finances, appropriations, or apparently anything else—or if an agreement between the members could be secured, a similar desirable condition of affairs between it and the President was wanting, and, in consequence, the session which began in December threatened to continue until the Potomac was again frozen over—when Old Sol asserted his ascendancy, and the summer heats and odors of Washington began to develop themselves, with what unanimity they commence to set the business of the two Houses in order, dispose of such measures as must be acted upon, postpone the others to a more convenient season, and, shaking the dust of the capital from their feet, hie themselves away to the green fields, watering places, or if this was impossible, to meet their constituents and explain to them those things which had seemed illogical or inconsistent when seen through the medium of press reports.

It is, indeed, a beneficence that brings about such a desirable result. Only consider for a moment what a terrible thing it would be for frequent and protracted sessions of the "WM. ORTON and GARDINER HUBBARD debating society" to be held under existing atmospheric conditions! Well might the members of the Appropriation Committee of the House and the Post-office Committee of the Senate pray to be delivered from such an affliction, and exclaim, with MERCUTIO, "A plague on both your Houses!" Only think of HUBBARD detained from the shores of Massachusetts Bay to watch and aid his telegraph monopoly project and counteract the statistics of the erudite PRESCOTT, and President ORTON summoned to the fray at short intervals to defend the telegraph interests of the Western Union Company against the onslaughts of the persistent HUBBARD! And then the unfortunate committeemen, already inextricably bewildered by the conflicting statistics mercilessly projected upon them by HUBBARD and SAUER on the one hand, and PRESCOTT on the other, and the unanswerable arguments pro and con of Messrs. ORTON, LOWERY, HUBBARD, RAMSEY, and last, but not most afflictive, of Colorado JEWETT—how could they be expected to endure more during this hot weather and live? We more than suspect that it was mainly out of consideration for all these parties that both the Senate and House resolved to bring the session to a close, and give them time to recuperate their energies and begin the never ending game over again next winter. Had this not been done, undoubtedly, before the sweltering dog days had come in August, an additional long row of tombstones would have made its appearance in the Congressional burying ground, upon each of which might be truthfully engraved the epitaph, "This man was talked to death on the subject of the postal telegraph!"

We will not pursue the painful subject further. Happily this sad fate has been avoided by the adjournment of Congress on Tuesday last, and now for a few

months we may have peace. Very likely our readers, who have followed us thus far, think that it is time we should give them a rest, and in this we fully concur. In conclusion, we would merely say that we trust no reader will exhaust his or her mental energies in trying to ascertain what this essay is about, or why it is written, and to save them from any unnecessary effort in that direction, will confide to them the secret that its purpose is to fill the space in the columns of THE TELEGRAPHER which is usually devoted to the leading editorial article.

The Volume Half Completed.

THE present number of THE TELEGRAPHER completes the first half of the Tenth Volume. Time passes so rapidly that it seems but yesterday that we wrote the article introducing the present volume to our readers; but six months have elapsed since that pleasant duty was performed, and from the middle of winter we are in the midst of summer.

The experience of the past six months has demonstrated the hold which THE TELEGRAPHER has upon the regard and esteem of the telegraphic fraternity of the country. The circulation has increased over the previous volume, and we are constantly receiving commendation and encouragement which is of the most gratifying character. We are assured, by those best capable of judging, that the present volume is an improvement, in almost every respect, over any which has preceded it, and that the paper has become indispensable to those who desire to keep up with the advance which science and the telegraphic art are constantly making.

Our advertising patronage is all that can be desired, and, in fact, not unfrequently exceeds the limits which we can devote to it. The value of THE TELEGRAPHER as an advertising medium is acknowledged, and the generous advertising patronage which it is favored with, is a convincing and satisfactory evidence of the fact.

This is the dull season, and we hope that the friends of the paper will bear this in mind, and will exert themselves to maintain and increase its subscription list, during the next two months especially. Efforts to that end at the present time will be doubly welcome and appreciated. We shall endeavor not only to maintain the present high character and value of the paper, but to still further add to them. No labor or expense requisite to this end has been or will be spared. THE TELEGRAPHER has become one of the established institutions of the country, and, as the representative of the telegraphic fraternity and of the great telegraphic interests of the country, should receive even a more general and liberal support than has already been accorded to it.

Quite a number of subscriptions expire with this number. These we hope to have promptly renewed, and accompanied by many in addition. Let every telegrapher, and every friend of an organ of the telegraphic fraternity, remember that the more liberal the patronage received the better paper can we furnish them with.

Congress and the Telegraph.

IN its anxiety to get away from Washington, and, perhaps, because of the muddle which, evidently, the subject has got into, Congress has adjourned without taking any action on the postal telegraph. We predicted this result at the commencement of the session, and the correctness of this prediction has become more and more apparent as the session progressed. Early in the winter it was the evident intention of Congress to give the subject the go by, and as little attention has been bestowed upon it as possible.

The next session is the short one—commencing on the first Monday of December next, and ending, by Constitutional limitation, on the fourth of March—and in this time there will be no opportunity, even if there was the desire, to give any considerable attention to the subject; so that telegraph interests may be considered practically safe from Congressional interference for the next year and a half, and, if wisely admini-

tered in the meantime, it will be a long time before any serious effort will be made to interfere with the existing telegraphic status. Believing as we do that this is the best policy for all concerned, we are rejoiced that the danger of such interference, which at one time was by many considered imminent, has been averted.

Now, let our telegraph managers pursue a wise and liberal policy, and go on and extend the lines and facilities to meet any reasonable demand of the public, avoiding any effort to establish a monopoly of the business, and they may calculate on a permanent condition of the present telegraphic status. So mote it be.

The Completion of the Euro-po-Brazilian Cable.

THE last section of submarine telegraph cable of the Brazilian line has been successfully laid, and South America has been placed in direct telegraphic communication with Europe. This is an important event, and completes another link in the electric girdle around the world. It has been justly the occasion of much rejoicing in Brazil and Portugal, and the usual congratulatory messages have passed between the Governments of those countries upon the establishment of telegraphic connection between the two countries.

The good work goes bravely on, and with the laying of the cable between our Pacific Coast and Japan and China the electric cord will engirdle the earth. This cannot be much longer delayed. The cable, and the capital for this will, no doubt, come from England—through the enterprise of whose scientists and capitalists the control of nearly the entire submarine telegraphs of the world has been centred in London—our own citizens generally confining their participation in such enterprises, however intimately connected with their interests, to fault finding and grumbling at alleged extortions of those who have risked their money in establishing them.

Personals.

Mr. WM. E. SMITH, who has occupied the position of manager of the Western Union Telegraph office at San Diego for two years, takes temporary charge of that company's office in Oakland to-day. Mr. SMITH is, besides being a first class lightning manipulator and genial gentleman of "fibre," a writer of no mean calibre.—*Daily Alta California, June 11.*

Mr. E. W. H. COGLEY, of the Western Union Baltimore, Md., office, has accepted a position with the same company at No. 145 Broadway, N. Y., vice Mr. CHARLES H. PARR, transferred to the day force.

Mr. CHARLES H. MIXER, quite recovered from his recent serious illness, has returned to duty at No. 145 Broadway, New York. Probably there has been no return there in a long time which has been a source of so much genuine gratification to all as that of Mr. MIXER.

Mr. GEORGE W. SAWYER, after quite a prolonged stay in the good State of Maine, is at his post at No. 145 Broadway, New York, again, looking as hale and hearty as a river pilot.

Mr. FRED. N. COOK, night operator with the Franklin Company at Providence, R. I., has resigned, to accept a position with the Western Union Company at Worcester, Mass.

Mr. D. W. GRANDY, late night operator in the Western Union office at Worcester, Mass., has accepted a position on the night force at 83 State street, Boston, same company.

The Telegraph.

By Cable.

LAYING THE EUROPO-BRAZILIAN CABLE.

LONDON, June 19.—The steamship Edinburgh, engaged in laying the section of the Euro-po-Brazilian submarine telegraph cable from St. Vincent, Cape de Verde, to the coast of Brazil, was at noon to-day in latitude 2 deg. south, longitude 32 deg. west.

LONDON, June 22.—The steamer Edinburgh, which is laying the telegraph cable from the Cape de Verde to Brazil, has arrived off the Brazilian coast. The following despatch was received to-day from on board:

"NOON, SUNDAY.

"Spliced on the intermediate cable in 1,100 fathoms

this morning. Hope to make the final splice at three this afternoon. The cable is in perfect condition."

THE EUROPO-BRAZILIAN CABLE COMPLETED.

LONDON, June 22.—The Brazilian cable has been successfully laid, and London is now in telegraphic communication with Brazil. The following despatch was received to-day from the officers of the Cable Company:

"PERNAMBUCO, June 22, 1874.

"The cable is in perfect order and will be opened to the public for business to-morrow."

REJOICINGS OVER THE COMPLETION OF THE EUROPO-BRAZILIAN CABLE.

PERNAMBUCO, June 23.

The successful laying of the submarine cable, bringing Brazil into telegraphic communication with Europe, has been the occasion of much pleasurable excitement in this country, and there is a general jubilee in Pernambuco

CABINET CONGRATULATIONS BETWEEN RIO AND LISBON.

LISBON, June 23.

The usual pleasant messages have passed between the governments of Portugal and Brazil over the establishment of telegraphic communication between the two countries.

TELEGRAPHIC CONFERENCE.

LONDON, June 23.

The London Post of to-day says an International Conference will assemble at St. Petersburg in 1875, for the purpose of revising the rules and regulations adopted by the Paris Convention of 1865, for the government of telegraphic lines.

Some twenty-two States are expected to be represented by delegates.

Foreign Telegraphic Notes.

INTELLIGENCE has been received in London that the steamship Gomes, belonging to Messrs. Siemens Brothers, having on board a section of the River Plate Telegraph Company's cable, had grounded at Rio Grande and become a total wreck. The crew was saved.

At a meeting of the shareholders of the Cuba Telegraph Company, held in London June 12th, resolutions were passed authorizing the raising of additional capital for laying a duplicate cable on a section of their line, in anticipation of the increased traffic about to be brought upon it by the Amalgamation of the Central American system with that of the West India and Panama. The chairman made a very satisfactory statement with respect to the improvement of the traffic, the receipts for the month of May showing a considerable increase over those of the previous month, and looked forward to still better results as soon as the union between the North and South American systems was completed and ready for business.

Reuter's Telegram Company (Limited), in view of the expected early establishment of direct telegraphic communication between Europe and South America, are organizing the extension of their system to the South American Continent. Agents will be appointed for the regular transmission of important political and commercial news to and from Europe and South America. The company will also undertake the transmission of private telegrams of one word and upwards. The names of firms and their various correspondents will be registered forthwith, free of charge, in order that the service may commence upon the opening of telegraphic communication.

Gas Lighting by Electricity.

A NEW pneumatic gas lighting apparatus, now being introduced by Mr. Asahel Wheeler, of Boston, Mass., was recently tested at Providence, R. I., with satisfactory results. A current of compressed air is transmitted from a central engine to diaphragms at the burners, the moving of which turns on the gas, which is then lit by an electric spark. Forty lights were kindled and extinguished simultaneously with great rapidity. It is stated that by this device all the street lamps in a city may be lit by the movement of a single lever, at any certain point.

Telegraphic Poetry.

THE operators of the Western Union Telegraph Company are becoming very "spruce" with regard to their toilets since the pretty compositor of a newspaper opposite has established herself beside the window. One of the operators—a very classic looking widower—has donned a white vest, to make himself

more conspicuous than his rivals. On his desk was found the following:

"I'd like to be a type,
And in my little case,
To be handled by an angel,
And look into her face—
For tho' 'tis pale 'tis charming,
As she looks across the street;
I'd bask in sunshine of her smile—
My heart is at her feet."

To which the red haired Italian added:

"Oh! charmer! quench the fire
Cremating this poor elf,
And stop his mad desire
Of a-killin' of hisself."

If that fair compositor has a heart she cannot resist that touching appeal.—*San Francisco Bulletin.*

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JUNE.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
18	69% ... 70%	...	...
19	69½ ... 70½	...	...
20	69% ... 70%	...	...
22	71 ... 73%	17 ... 17	...
23	73% ... 74%	...	...
24	74% ... 75%	17 ... 17	...

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ending May 26, 1874, and bearing that date.

151,209.—AUTOMATIC TELEGRAPHY AND PERFORATORS THEREFOR.—Thomas A. Edison, Newark, N. J.—Case 83. Application filed September 2, 1873.

Roman letters formed by perforations. Depression of one key selects and actuates the required punches, from a number thereof, to form the letter corresponding to such key. Message is chemically printed at receiving end in Roman letters.

1. A strip of telegraphic transmitting paper perforated with holes of uniform size, grouped together to represent ordinary letters or figures, substantially as set forth.

2. The mechanism for making groups of perforations in a strip of paper in imitation of letters or characters, the same consisting of punches massed together in a square, or nearly so, and mechanism intervening between such punches and the finger keys, for selecting from such mass of punches those that are required for perforating characters corresponding with the characters upon the respective finger keys, substantially as set forth.

151,335.—ELECTRO-MAGNETIC CAR BRAKE.—Francis F. A. Achard, Paris, France. Application filed January 15, 1874.

Circular magnets on an axle suspended by pivoted frame; circuit closed thereto; they are attracted against axle of wheel, which communicates rotary motion to the magnets and drums attached thereto, brake chains being wound up on latter.

The suspended shaft A, carrying the circular magnets L L, the central magnet C, and the loose drums F F, combined with the axle Q and brake chains H, substantially as and for the purpose specified.

For the week ended June 2, 1874, and bearing that date.

No. 151,568.—THERMO-ELECTRIC PILE. Charles Clamond, Paris, France. Application filed May 22, 1874.

1. The mode of uniting the negative strip with the bar by means of a metallic ring or bent, soldered to or making part of the strip, and incorporated into the body of the bar by casting, substantially as set forth.

2. The manufacture of the bars of thermo-electric piles, by casting the same in moulds preliminarily heated to near the fusing point of the thermo-electric material, as set forth.

3. The combination, with the elements A, of the central perforated radiating cylinder B, made of refractory material, the pipe E, and the Bunsen burner C, the same being arranged and operating together, as herein shown and set forth.

For the week ended June 9, 1874, and bearing that date.

No. 151,750.—ELECTRIC SIGNAL APPARATUS FOR FIRE HOSE.—JOSEPH BUCHTEL, Portland, Oregon. Application filed April 1, 1874.

Sections of both wires always connected, and both he lices at each coupling protected by a single sheath.

In a fire telegraph the insulated wires D D, embedded in the hose A, and having their sections connected by the double coil D', enclosed in the case F, substantially as shown and described.

Born.

WELLER.—At Brooklyn, Long Island, Sunday, June 21, to Mr. L. E. WELLER, of No. 145 Broadway, N. Y., a daughter.

Married.

WHEELER—BASSETT.—At the residence of Jacob Norcross, Esq., Albany, Oregon, June 11, 1874, by the Rev. S. G. Irvine, Mr. CHARLES R. WHEELER, operator at Shedd's Station, O. & C. R. R., to Miss ORPHA BASSETT, of Albany.

Still another! A terrible epidemic is sweeping off the Oregon telegraphers into matrimony very rapidly. The one in this case had the presumption to come to Albany and carry off a cousin of the undersigned—chief monner—but who forgives them both, and wishes them a long, happy and prosperous life.

THE NONPAREIL TELEGRAPH APPARATUS,
NEW AND IMPROVED, WITH STRAIGHT LEVER KEY.

FOR AMATEURS, STUDENTS AND SHORT LINES.

This popular *Pioneer Cheap Telegraph Instrument* has recently been improved and a *Straight Lever Key* placed upon it, which makes it as nearly perfect as possible. Since its introduction over 2,000 of them have been sold, and it is still the *leading telegraphic apparatus of its class.*

They are furnished at the following popular prices:

Single Instruments, with three cells of Battery, Chemicals, Connecting Wire and Instruction Book, \$6.50
Two sets of Instruments, etc., 12.00

Send for our new Circular and Price List.

F. L. POPE & CO.,

(P. O. Box 5503.)

38 Vesey street, N. Y.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

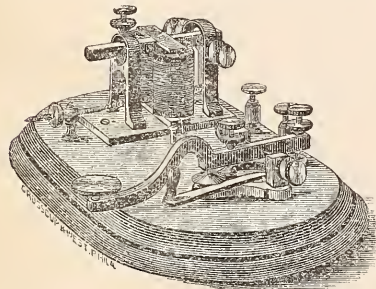
COMPARISON OF RATES.

New York to TRENTON, 20 words	By Automatic. 25c.	New York to TRENTON, 20 words	By Wes'n Union. 45c.
PHILADELPHIA, 20 "	25c.	PHILADELPHIA, 20 "	50c.
BALTIMORE, 20 "	25c.	BALTIMORE, 20 "	70c.
WASHINGTON, 20 "	25c.	WASHINGTON, 20 "	70c.
Each additional word	1c.	Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,
WATERLY HEIGHTS, PENNSYLVANIA.
PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

If money be sent in advance by registered letter. 12 00

Instruments without Battery. 11 50

Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

SEND FOR CIRCULAR.

WILLIAM BROWNLEE,
Dealer in
CEDAR TELEGRAPH POLES.
OFFICE FOOT OF LIBERTY STREET,
DETROIT, MICHIGAN.

GOOD NEWS FOR TELEGRAPH STUDENTS.

An Instrument has been invented, which is now offered for sale—prices within the reach of all—enabling both young and old to become proficient at a minimum expense. The beauty and finish delights all. The sound is perfect, and only needs an inspection to assure the idea of perfection of the invention.

No. 1. Instrument, with Alphabet.	25 cents.
" 2. " " " "	50 "
" 3. " " " rubber knobs.	75 "

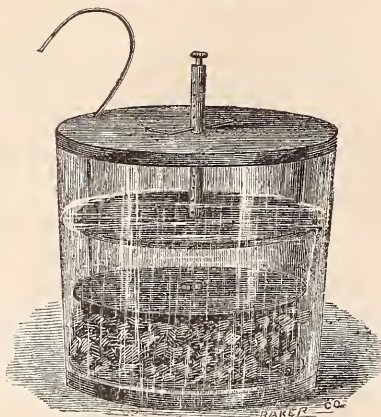
A LIBERAL DISCOUNT TO AGENTS.

Send for Sample and Prices.

ADDRESS, G. A. WESSMANN,
544 Nostrand Avenue,
BROOKLYN, N. Y.

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

41 THIRD AVENUE,

Chicago, Ill.

PARTRICK, BUNNELL & CO.,

38 SOUTH 4th ST., PHILA.,

AND 22 DEY ST., NEW YORK,

MANUFACTURERS OF

UNRIVALLED MORSE INSTRUMENTS

CHAMPION LEARNERS' APPARATUS,

with Complete Instructions, Battery, Wire, etc.,

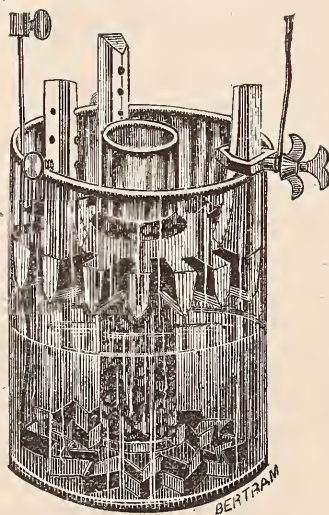
GIANT SOUNDERS,

Improved Curved Keys,

Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines, Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

ANNOUNCEMENT!

Messrs. PARTRICK, BUNNELL & CO.

herby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

22 DEY STREET,
NEW YORK,

where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL

AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in

CHAMPION LEARNERS' INSTRUMENTS,

NEW GIANT SOUNDERS, PERFECTED,

IMPROVED CURVED KEYS,

ELECTRIC BELLS, IN GREAT VARIETY,

NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED

LIGHTNING ARRESTERS,

LATEST AND BEST FORMS OF GRAVITY BATTERIES.

Together with LINE WIRE,

OFFICE WIRE, BRACKETS,

INSULATORS, LINE TOOLS, Etc.

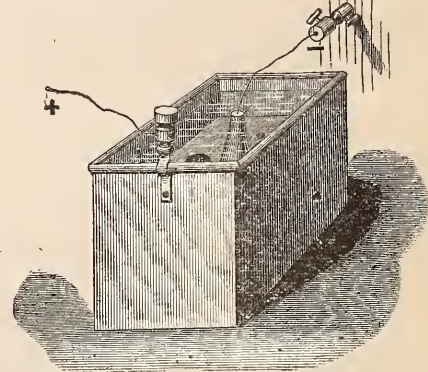
Send for Catalogue and Price List.

PARTRICK, BUNNELL & CO.,

22 DEY STREET, NEW YORK.

38 South Fourth Street, Philadelphia.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

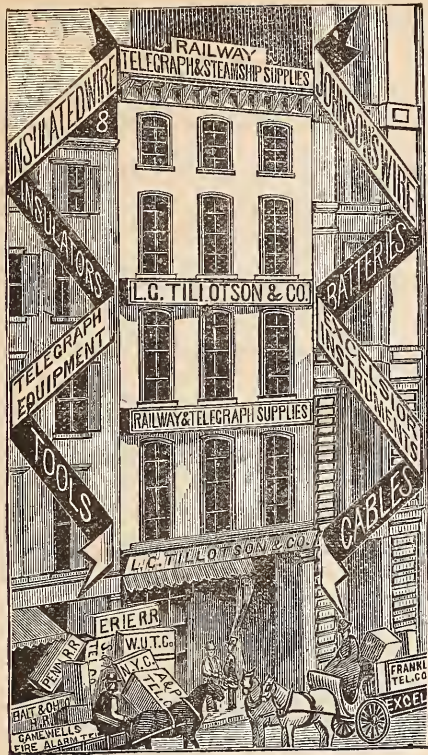
On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.)

38 VESEY STREET, N. Y.



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY** THE **BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

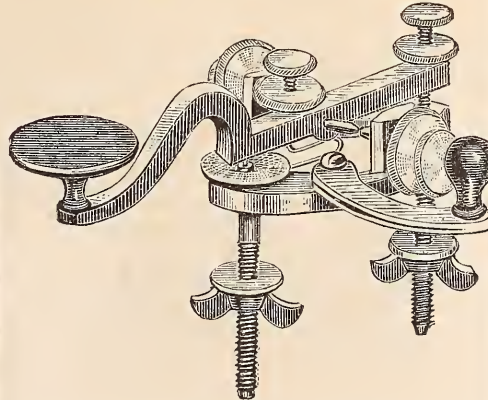
SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,

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WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out. Acknowledged to be a decided improvement. Price, same as the ordinary key. Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
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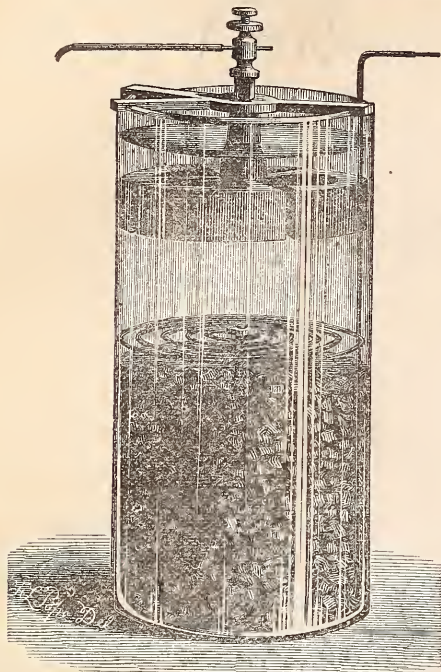
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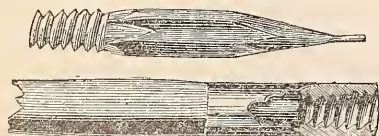
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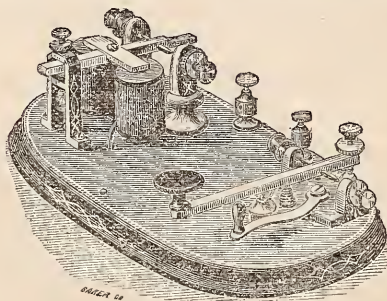
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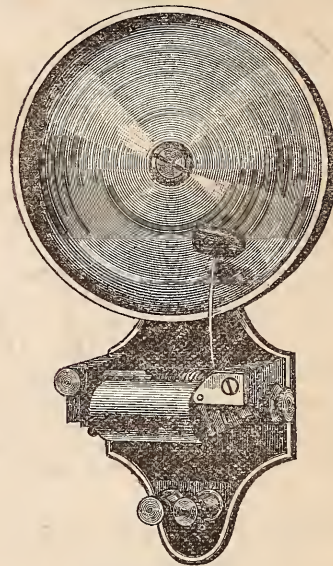
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Vol. X.

New York, Saturday, July 4, 1874.

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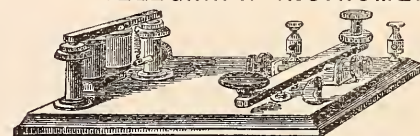
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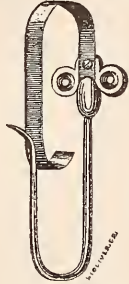
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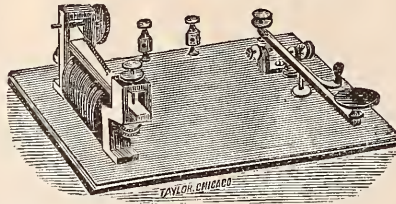
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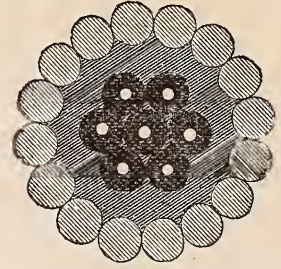
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JULY 4, 1874.

VOL. X. WHOLE No. 416.

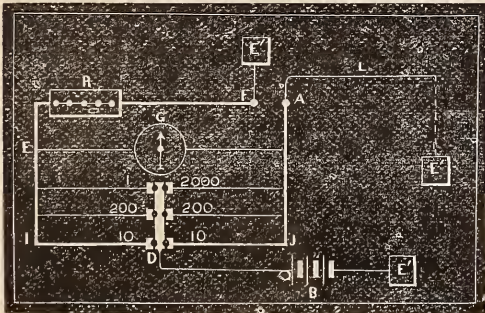
Original Articles.

Earth Currents.

THE questions of the hour appear to be, "What is a farad?" and "How can the true resistance of a wire be obtained when an earth current flows over it?" The farad matter seems to be satisfactorily explained but there still exists doubt in relation to the latter.

It is generally conceded by scientists that different points upon the earth's surface possess different potentials, and, if two such points be connected by a telegraph wire, a current of electricity will flow over the wire in a direction toward the point of lowest potential. This may account for the earth currents found upon lines of considerable length; but earth currents are also found upon lines of only a few yards in length. If two gas posts be connected by an insulated wire, a current will be found to flow over it. If two similar pieces of iron, or other metal, be buried in moist earth, or immersed in a jar of pure water, a current is established upon connecting the two pieces of metal by a wire. It is probable that the cause which produces the difference of potential, when two plates are buried in moist earth, is identical with that of plates immersed in a jar of water. In other words, that two metal plates buried in the earth and connected by a wire act simply as a cell of battery.

It is not so important to know the origin of these earth currents as to know how to eliminate them in testing. This point seems to be unsettled yet. The following diagram will show how the earth currents affect the test:



The diagram represents the design of the Wheatstone balance, manufactured by Messrs. Gray & Barton. The battery current, starting from B, on reaching D, finds two routes. If both routes have an equal resistance the current divides in two equal parts, one part reaching the earth at F, the other at the extremity of the line at a. No part of the current will flow through the galvanometer G. But an earth current entering the line at b, on reaching c, finds three routes to the ground—one through G, E, R and F; one through G, I, D and B, the other through J, D and B. When there is no earth current, the resistance unplugged in order to bring the needle to zero, is the true resistance. If, however, an earth current enters the line at b, a portion of it passes over the bridge and deflects the needle. In order to counteract the effect of the earth current upon the needle the balance must be changed, so that a portion of the testing current will flow over the bridge equal to the earth current, and in an opposite direction. It is evident that by this change the resistance unplugged will not be the true resistance of the line, but either too great or too small, according to the direction of the earth current.

For example: Suppose the two first branches of the bridge have equal resistances, the third branch a resistance box with 60 ohms unplugged, the fourth having in circuit a line of 60 ohms resistance—by closing the battery key no current will flow through the galvanometer (if there is no earth current) because the branches are proportional. Now, suppose an earth current be introduced upon this line, it would flow to the point c, in diagram, and a portion pass over the bridge deflecting the needle. In order to bring the needle back to zero we must unplug or plug up resistance, as the case may be. In this case, suppose we have to plug up 10 ohms, making the total resistance un-

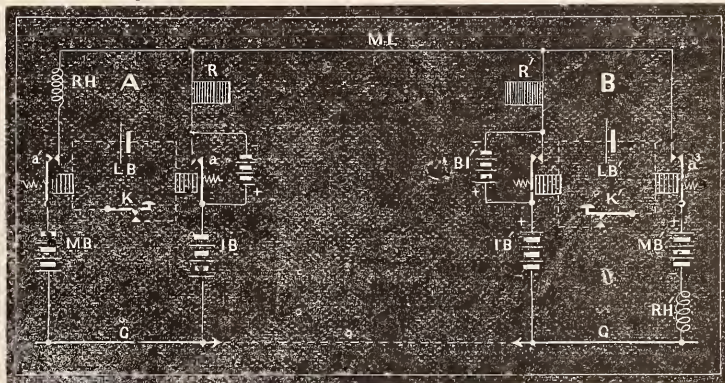
plugged 50 ohms—by reversing the poles of testing battery the current that before neutralized the earth current now passes in the same direction as the earth current, and the force tending to deflect the needle is double that of the earth current alone. In order to again bring the needle to zero we should have to unplug an additional resistance twice as great as was plugged in the first place, or 20 ohms. The mean between 50 and 70 ohms in this case would approximate the true resistance. It would not be absolute, because, in changing the resistance, we change the joint resistance of the bridge and vary the testing current. It would be necessary to unplug a little over 70 ohms to balance the needle.

From the foregoing we conclude that the mean between the positive and negative readings is the true resistance, or very nearly so in certain cases. In working short lines especially, care should be taken to have the battery current pass in the same direction as the earth current; the earth current will then assist the battery current; whereas, if they pass in different directions, the difference between the two currents would be the effective working current. By alternately grounding the two poles, one can tell by the working of instrument which one gives the best result.

Chillicothe, Ohio, June 24. I. N. MILLER.

A New System of Duplex Telegraphy.

IN *The Telegraphic Journal* of October 1st, 1873, Mr. Preece makes a statement to the effect that if there was no extra adjustment necessary to maintain a balance in duplex telegraphy, it would be "simplicity itself," and that this "is a problem remaining to be solved." Being but a callow telegrapher and scientist I submit the following, and invite criticism or improvement, if worthy of either:



At terminal office B, from copper plate + of main battery, M B', say fifty cups, all the current goes to main line M L through armature a, for it cannot go to ground G, through battery I B', of fifty cups, because it meets a like pole; therefore, the outgoing current does not affect relay R' at that station.

At terminal office A the incoming current divides one half through relay R, armature a, and battery I B to ground G; the other half through rheostat Rh' of same resistance as relay R, through armature a', and main battery M B to ground G. At terminal office B the outgoing current goes to ground and through earth to B, same as the other current went to main line from B—the other apparatus at each end being arranged exactly alike, with the above exception. When key K' is opened by sending operator, the circuit of local battery L B' is broken (which operates the two sending sounders in the local circuit, the armatures of which perform the office of keys), and the armature a' opens main battery M B' branch of main line, therefore no current goes to relay R from B. But the half of outgoing current from A, which went through M B', now flows through relay R'; but being forced to flow through a resistance or neutralizer I I B' of sufficient resistance to neutralize this added current, it does not affect relay R', for the instant key K' is opened armature a' opens relay branch of main line between the two connections of the L I B' circuit.

Thus, with common instruments and without any extra resistance above half of that relay opposed to main current, half of battery current, less main line leakage affects receiving instrument, without any changing of adjustment above that required in the single working circuit. I claim the above as my invention.

S. J. M. BEAR.

Mitchell, Iowa, June, 1874.

It has just been learned that Galvanism was discovered by a man named Swammerdam, 130 years before Galvani called attention to it. The world, however, will not willingly change the name in order to give him the honor belonging to him. Swammerdamism would be awful.

[From *The Telegraphic Journal*.]

Electrical Apparatus used by Robert Houdin.*

ROBERT HOUDIN'S house was called the Priory. The entrance was for carriages by a large gate, for visitors on foot by a door on the left. A box on the right received newspapers and letters. The house stood about 430 yards from the entrance gate, and a broad winding carriage-way led to it across a park shaded by aged trees.

The door on the left is painted white and has on it, at the usual height, a plate of gilt copper, bearing the name, "Robert Houdin." Under this plate there is a little knocker, also gilt. The visitor lifts the hammer according to his taste; but however feeble the stroke, a bell peals through every part of the house at 430 yards distance, and does not cease to ring until the lock is opened. In order to open this lock it is only necessary to push in a button in the wall. By the bell ceasing to ring the servant is made aware that he has shot the lock, and at the same time that the bolt is shot. The name of Robert Houdin disappears suddenly, being replaced by an enamelled plate bearing the word "Entrez," painted in large characters. The door closes with a spring, and when once shut no one can go out again without enacting certain formalities. As it opens it automatically causes a bell to give two distinct peals at two different angles of its opening and shutting. These four little peals, although produced by different movements, are heard at the Priory, spaced by silences of equal duration. To illustrate, let us suppose that a solitary visitor arriving at the gate knocks thereat, the people at the house open the lock, and the visitor enters, pushing the door, which shuts instantly by means of a spring. The four strokes of the bell caused by the opening and shutting of the gate followed, at equal intervals of time—drin, drin, drin, drin—so that the people at the house are aware only one person has

arrived. Supposing, however, that several visitors come, the first enters pushing the door, and according to the rules of politeness holds it open until each has passed, but the interval between the two first and the two last peals is proportional to the number of persons who have entered. The chime is heard thus—drin—drin—drin—drin, and the calculation of the number is very easy to an experienced ear. An habitual visitor makes himself easily known. He knocks, and knowing what ought to happen, he does not stop, as one might say, at the foolish tricks of the gate. The door

has no sooner been opened than the four equidistant peals are heard and announces his entrance. It is not the same in the case of a new visitor. When the word "Entrez" appears his surprise causes him to pause, and it is only after the lapse of some seconds that he makes up his mind to push in the door. His step is slow, and the four peals are like his step—drin—drin—drin—drin. The people at the Priory prepare to receive a new visitor. Again, the travelling beggar lifts the knocker timidly. Fearing some mistake he hesitates to enter, and if he does so, it is only after some seconds of waiting and uncertainty. As the people at the house hear the peal thus—d-r-i-n—d-r-i-n—d-r-i-n—d-r-i-n, they know that some poor person is about to enter. They go forth to meet him and are never deceived. Suppose, however, that some one comes to pay a visit in a carriage, the footman descends from his seat and immediately proceeds to open the little gate. Having entered he finds hanging on the inside the key of the large gate, which an inscription points out to him. He has nothing to do but to open the two folding doors. This double movement is heard and seen at the house by means of the chimes, and a tablet placed in the hull on which are painted these words: "The doors of the gate are—the blank space being followed by the words "open" or "shut," according to the state in which the gate is. M. Houdin continues, with this tablet I can assure myself every evening that the gates of the house are shut.

Let us go on, however, to describe the letter-box. It is closed by a little swinging lid, arranged in such a manner that when it is opened it causes an electric peal to ring at the Priory. The postman has an order to put in at once with a single movement all the newspapers, and then in the same way the circulars, after which he puts in the letters one by one. The number of each kind sent is made known to a person at the house, so that if one is not an early riser he can count the different parts of his post-bag lying in bed. To avoid the trouble of sending letters to the post-office in the village we write in the evening; then, by turn-

* Abstract of a paper by the late Robert Houdin in *Les Mondes*.

ing an index, called a "communicator," we change all the arrangements; that is to say, the postman the next morning, when putting his letters into the box, instead of sending a peal to the house, hears one near him, which tells him to go there and take the letters. My electric porter leaves me nothing more to desire. His performance is most exact, his fidelity is above all proof, his discretion is without equal, and as to his expense, I doubt whether it would be possible to give less for so perfect a servant.

I now proceed to give some details of a plan, by the aid of which I can take care that my horse shall have his proper amount of food at the right time. This horse is a mare, a good natured old girl, somewhat aged, which answers to the name of "Fanchette." We regard her as almost the friend of the house. Fanchette has a person appointed to feed her. This is a very honest boy, who, in consequence of his honesty, does not take offence at my electric plans. But before this servant I had another who was an active, intelligent man, passionately attached to the art which was formerly cultivated by his master. He only knew one trick, but he executed it with rare ability. This trick consisted in changing my oats into five franc pieces. The stable is only forty-four yards distant from the house, but in spite of this distance it is my workshop which makes the distribution. A clock is charged with this duty, and is assisted by the aid of an electric communication. The distribution takes place three times a day at fixed hours. The distributor is of the greatest simplicity. It is a box of the form of a funnel, filling the measure in a proportion regulated beforehand. But it might be asked, would not a person steal the oats from the horse as soon as they fell into the manger? No. For the electric arrangement which causes the oats to fall into the manger could not have effect unless the door of the stable is locked. But could not the thief be shut in along with the horse? That is not possible, because the bolt will not shut except from the outside. Then one could wait until the oats had fallen in to go in and take them away. Yes; but there is a warning of this by a chime, arranged in such a manner as to be heard in the dwelling house if any one opens the door before the oats are entirely eaten by the horse.

The clock of which I have just spoken has the duty also of transmitting the hour, by the same electric thread, to two large dials placed one in front of the house and the other at the gardener's lodge. The first indicates the hour to the whole valley, the second—since the gardener's lodge faces all our windows—gives to the people of the house a uniform and regular time. This time is communicated by the same process to many different dials in many parts of the dwelling. There belongs, common to all these dials, a single bell, which can be heard by the inhabitants of the Priory, and also by the whole village. It is on the top of the house, under a sort of campanile, and is used to call the people together at meal hours. I placed, under this bell a clock-work sufficiently powerful to raise the hammer at the required time. But as it is necessary to wind up the weights of this machine daily, I availed myself of a lost, or, to speak more correctly, a not utilized force, to perform this duty of itself. For this purpose I established a connection between the folding doors of the kitchen, situated on the ground floor, and the winding part of the clock at the top of the house, arranged in such a way that in going and coming at their work the servants constantly wind up the weights of the clock without any idea of what is going on. This is almost a perpetual motion about which one need never take any trouble. An electric current lifts the catch of the striking part, and causes it to make the number of strokes indicated by the dials. This distribution of the time gives me the power of using on certain occasions a little trick which is very useful to me. When for any cause I wish to have my meals sooner or later, I secretly press a certain electric spring, and I put on or back at my will the dials and striking arrangements of the house. The cook often finds that the time passes very quickly, and I gain a quarter of an hour more or less which I should not have obtained otherwise. It is again the same regulator which every morning, by the aid of electric connections, awakes three persons at different hours. The alarm rings for that purpose sufficiently loud to awaken the heaviest sleeper, and it continues to strike until the person to be called displaces a little spring at the extremity of the room. For that purpose he must get up, and then the point is gained.

I torment my poor gardener well with my electricity. Would one believe that he cannot warm my conservatory beyond 10 degrees of heat, or lower the temperature beyond 3 degrees of cold without my knowing it? In the morning I say to him—"John, you raised the heat too high; you broiled my geraniums;" or, "John, you are in danger of freezing my oranges; the thermometer has fallen to 3 degrees below zero." John scratches his ear and does not answer; I am sure he regards me in some measure as a sorcerer. A similar arrangement is placed in my wood store to warn me of the least danger of fire. However

trifling in value my precious objects may be, I endeavor to preserve them, and for this purpose I think it right to take precautions against thieves. All the doors and windows of my house have an electric communication which connects them with the chimes, and are so arranged that when one of them moves the bell rings the whole time of its opening. What a nuisance it would be if the chimes sounded every time a person opened a window or wished to go out of the house. It is not so. The communication is interrupted all day, and is only established at midnight. The clock for feeding the horse establishes this. When we are away from the house the electric communication is permanent, and in case of opening with malicious intent, the great chime of the clock—of which the catch is raised by electricity—rings without ceasing, and produces the sound of alarm. The gardener, and even the neighbors, thus warned, the thief would easily be taken in the trap. We amuse ourselves often with shooting with a pistol. We have a very well arranged ground for this purpose; but in place of the usual way of announcing the part of the target struck, the one who makes a bull's eye sees a coronet of leaves suddenly appear on his head. There is in my park a deep road which it is sometimes necessary to pass. There is no kind of bridge for this purpose; but on the edge of the ravine a small seat is to be seen. The person out walking sits down, and he is no sooner seated than he finds himself transported to the other side. The traveller puts his foot on the ground, and the little seat returns to bring another passenger. This arrangement works both ways; there is the same aerial voyage in returning.

A New Printing Telegraph.

Mr. GEORGE W. HOWE, of Stevenson, Ala., has recently taken out a patent on a printing telegraph apparatus which possesses many novel features, differing widely from any of the previously existing inventions in this line. Instead of employing a separate key for each letter, Mr. Howe makes use of six keys only. By pressing down single keys, six different letters may be printed. By combinations of two keys twelve more letters are obtained, while the remaining letters are formed from combinations of three keys. By a peculiar arrangement of mechanical circuit closers, governed by synchronous mechanism at the two ends of the line, and working in combination with the keys, two or more instruments may be simultaneously employed in transmitting over the same line. The essential principle of Mr. Howe's system consists in transmitting, at regular and fixed intervals of time, from one to three pulsations or waves of electricity for each letter, which, on arriving at the distant instrument, are, by means of a synchronously moving commutator, distributed into three different magnets, which, under the influence of positive and negative currents, control a series of six pins. By their different combinations these pins control the necessary mechanism for printing all the letters of the alphabet. The printing apparatus is actuated by a local circuit and electro-magnet. Each complete instrument consists of a key-board of six keys, a printing register and a revolving circuit closer or commutator, provided with an automatic unison stop. The auxiliary instruments consist simply of a key-board and register.

Instead of being placed upon the periphery of a wheel the type are in a straight row, in a movable, horizontal type box or port rule, and are each capable of a vertical independent movement. When a letter is to be printed, the type box is moved horizontally until the desired letter is brought to a given point, and the type bearing that letter is then struck upward by the printing mechanism against the paper, which is in the usual form of a long strip.

It would be difficult to convey a proper idea of the details of this unique invention without the aid of numerous illustrations; but the general principle of its operation will be readily inferred, by those versed in such matters, from the necessarily brief and imperfect description given above.

The Telegraphers' Mutual Benefit Association.

Assessments Nos. 63, 64 and 65, issued June 25, 1874.

DEATH OF MARCELLUS C. HART, A. R. WALSH AND T. W. PRIEST.

MARCELLUS C. HART (Certificate No. 996, issued October 27, 1870), died at Collinsville, Ill., April 21, 1874, of consumption.

Anthony R. Walsh (Certificate No. 2079, issued July 8, 1873), died at Louisville, Ky. Mr. Walsh, in a temporary fit of insanity, threw himself from an upper window of the Galt House, Louisville, May 3d, 1873.

Thurlow W. Priest (Certificate No. 1730, issued December 21, 1872), died at Kalamazoo, of epilepsy, May 9th, 1873.

Members holding certificates numbered up to and including No. 2250 will please remit for above assess-

ments. Those numbered from 2251 to 2260, inclusive, will please remit for Nos. 64 and 65. No. 2262 should remit for No. 65.

By reference to the statement on second page of this sheet, it will be seen that the reserve fund is now \$3,828.17, requiring only \$172.00 more to enable the association to meet an assessment without calling on the members.

The payments of assessments have been well and faithfully made. The falling off of 133 members is to be regretted, but it is hoped they will reconsider their action, and, by application for readmission, make the payment of the next assessment from the reserve fund sure.

Let the payments for assessments 63, 64 and 65 be met and made without the loss of a single member. The notice of an assessment is evidence of the faithfulness of the member for whom the call is made, and having shared the protection which his prompt payments aided in giving, there should be no faltering in contributing to the fund his heirs have a right to expect.

The initiation fee of \$1.50, increased by the increase in the reserve fund to \$2.50, is now \$3.50.

Agents and members will please take notice of this fact, so as to be able to inform applicants for membership.

W. HOLMES, Secretary.
J. D. REID, Treasurer.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 62, UP TO AND INCLUDING JUNE 23, 1874.

5, 13, 26, 31, 53, 55, 70, 72, 76, 80, 84, 89, 97, 101, 108, 114, 136, 139, 146, 171, 178, 181, 183, 189, 190, 191, 193, 197, 198, 206, 218, 227, 230, 240, 252, 271, 280, 312, 316, 319, 323, 328, 353, 357, 362, 364, 366, 371, 376, 382, 402, 414, 418, 441, 456, 466, 468, 469, 470, 471, 475, 476, 484, 511, 512, 514, 516, 554, 555, 556, 557, 560, 565, 569, 573, 574, 575, 584, 586, 594, 642, 648, 655, 662, 663, 664, 665, 669, 670, 690, 701, 710, 712, 722, 730, 733, 752, 772, 781, 782, 783, 785, 786, 787, 802, 803, 808, 809, 820, 836, 838, 841, 842, 848, 870, 871, 886, 901, 904, 905, 906, 916, 922, 926, 927, 938, 939, 942, 943, 944, 949, 980, 1000, 1002, 1014, 1016, 1026, 1030, 1031, 1033, 1034, 1041, 1050, 1057, 1038, 1063, 1074, 1075, 1076, 1080, 1085, 1093, 1099, 1100, 1101, 1102, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1121, 1122, 1123, 1131, 1141, 1144, 1149, 1164, 1187, 1190, 1191, 1193, 1194, 1226, 1227, 1233, 1237, 1238, 1240, 1241, 1245, 1255, 1256, 1270, 1277, 1281, 1282, 1283, 1284, 1285, 1286, 1288, 1289, 1294, 1304, 1307, 1308, 1309, 1311, 1312, 1313, 1314, 1815, 1317, 1318, 1319, 1320, 1321, 1322, 1336, 1339, 1340, 1342, 1344, 1346, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1366, 1371, 1372, 1375, 1376, 1398, 1405, 1406, 1415, 1417, 1418, 1427, 1428, 1430, 1431, 1432, 1433, 1437, 1438, 1448, 1449, 1457, 1458, 1465, 1469, 1471, 1474, 1475, 1476, 1481, 1483, 1490, 1497, 1498, 1500, 1501, 1503, 1505, 1508, 1513, 1515, 1522, 1528, 1529, 1530, 1532, 1546, 1558, 1569, 1572, 1573, 1576, 1580, 1586, 1596, 1597, 1603, 1604, 1605, 1607, 1608, 1616, 1619, 1620, 1626, 1631, 1639, 1649, 1650, 1652, 1653, 1655, 1660, 1601, 1662, 1663, 1665, 1666, 1673, 1676, 1681, 1682, 1684, 1687, 1688, 1692, 1699, 1700, 1701, 1702, 1704, 1709, 1710, 1713, 1714, 1723, 1724, 1732, 1733, 1737, 1737, 1745, 1746, 1747, 1750, 1751, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1768, 1769, 1771, 1773, 1775, 1785, 1794, 1795, 1796, 1797, 1799, 1804, 1807, 1813, 1815, 1817, 1823, 1824, 1828, 1835, 1839, 1840, 1841, 1844, 1845, 1852, 1857, 1858, 1859, 1863, 1864, 1889, 1895, 1896, 1897, 1916, 1917, 1921, 1923, 1924, 1926, 1931, 1942, 1964, 1965, 1969, 1978, 1985, 1986, 1987, 1991, 1992, 1993, 1994, 1996, 1997, 2007, 2010, 2012, 2015, 2016, 2020, 2023, 2033, 2041, 2045, 2053, 2060, 2061, 2072, 2074, 2075, 2084, 2085, 2092, 2094, 2098, 2101, 2108, 2109, 2114, 2119, 2120, 2123, 2125, 2130, 2131, 2134, 2136, 2141, 2155, 2159, 2165, 2166, 2167, 2170, 2171, 2180, 2183, 2184, 2185, 2193, 2198, 2207, 2209, 2210, 2214, 2217, 2226, 2227.

ASSESSMENTS NOS. 63, 64 AND 65.

4, 21, 131, 188, 208, 277, 286, 289, 464, 564, 626, 722, 742, 858, 859, 923, 932, 1357, 1489, 1516, 1862, 2197.

ASSESSMENT NO. 61.

5, 51, 178, 185, 186, 187, 271, 319, 466, 468, 469, 470, 471, 475, 514, 516, 560, 652, 695, 697, 705, 801, 943, 1026, 1063, 1071, 1187, 1371, 1400, 1449, 1497, 1504, 1532, 1556, 1557, 1570, 1603, 1604, 1605, 1607, 1608, 1613, 1620, 1639, 1653, 1655, 1670, 1690, 1691, 1692, 1699, 1741, 1745, 1798, 1799, 1807, 1835, 1923, 1924, 1926, 1945, 1946, 1947, 1978, 1994, 2015, 2094, 2109, 2141, 2151, 2165, 2170, 2192.

ASSESSMENTS NOS. 58, 59 AND 60.

271, 288, 1026, 1207, 1604, 1607, 1608, 1609, 1692, 1699, 1798, 1934, 1978, 2128.

ASSESSMENTS NOS. 55, 56 AND 57.

1798, 1933, 1934.

MISCELLANEOUS.

58.—19, 800, 1933.
59.—19, 800, 1933.
63.—64, 414, 509, 825, 912, 916, 917, 1169, 1178, 1678, 2196, 2201, 2221, 2236, 2237, 2242, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260.
64.—64, 509, 912, 917, 1178, 2237, 2261, 2262.
65.—2261.

Telegraphic Base Ball Celebration of the Fourth of July.

THE readers of THE TELEGRAPHER will doubtless remember a very humorous account of a base ball match between the Dots Base Ball Club of Buffalo, New York, and the Dashes of Cleveland, Ohio, played at Erie a year ago, from "Owton A. Flye," in which the Dots retired without achieving that success anticipated when they started for the fray. These clubs are composed respectively of the employés in the Western Union offices in the two cities.

The Dots have invited the Dashes to visit them to-day at Buffalo, where they propose to entertain them, and, if possible, send them home happy but vanquished.

The following correspondence will, no doubt, be read with interest by all telegraphers:

THE DOTS TO THE DASHES.

BUFFALO, June 8.

W. N. Hinman, Esq., Secretary Dashes B. B. C., Cleveland, O.

At a meeting of the Dots Base Ball Club held to-day, resolutions were adopted instructing me, on behalf of that organization, to send you a cordial invitation to visit us here on the glorious Fourth, when the second game of the series will be played. Your entertainment here will be amply provided for. An early reply from you is desired, so that many necessary arrangements may be perfected. It is desirable that you bring as nearly as possible the same nine with whom we struggled at Erie a year ago. Defeat has rested heavily on our heads in the days that are gone, and that ambition which is the underlying prop of our lives seems anxious to mark out for us a far more exceeding weight of glory. Yours, with an eye to victory,

J. W. LARISH, Secretary.

THE DASHES TO THE DOTS.

CLEVELAND, OHIO, June 17.

J. W. Larish, Esq., Secretary Dots B. B. C., Buffalo.

Your exceedingly cordial letter, containing the hospitable invitation, was duly received, and a meeting of the Dashes held on Saturday, the 13th instant. In accordance with instructions I then informed you by telegraph that it was the unanimous desire of the members to become the recipients of your generous liberality, and each individual player is vigorously exercising his muscularity in anticipation of the coming fray, resolved to claw the pinions of the aerial Dots and unmercifully extinguish that eagle "eye to victory" which glares upon us. We cannot play with exactly the same nine we did last year—one died during the past winter and another has left the office—but at least six, and perhaps seven of the participants in that game will seek to gather fresh laurels on the coming Fourth. Yours, with intensified composure,

W. N. HINMAN,
Secretary Dashes B. B. C.

Below are the names of the members of each club:

DASHES OF CLEVELAND.

DOTS OF BUFFALO.

Bohne, p.
Hoffman, c.
Fell, 3d h.
Castle, 1st b.
Hinman, 2d b.
Jones, s. s.
Johnson, r. s. s.
Gurley, l. f.
Greene, r. f.
Melton, c. f.

Lees, c.
Kendrick, p.
Dudley, s. s.
Larish, 1st. b.
Barker, 2d b.
Wand, 3d b.
Karbach, r. s. s.
Voas, l. f.
Davidson, c. f.
Dolan, r. f.

One Way to Stop It.

Who knows but, perhaps, the day will come when all the conversation of this earth shall be conducted with the snapper sounder?

Xantippe's scolding might, perchance, have sounded more musically to the ear of the distracted Socrates if it had been transmitted to him by this improved (?) method, and one imagines the bull-frog and the katydid sinking into ignominious silence, routed by the echo of thirteen thousand, more or less, of this delectable invention in the hands of juvenile America. The wonder of the day, however, becomes the old story of to-morrow, and only to the ignorant is there anything new under the sun—of the truth of which the following

incident would afford an illustration, if such were needed:

Mrs. Moore, desiring at times to indulge in a little domestic telegraphy, had a wire run from the basement of her domicile to the second story sitting room thereof, and equipped with a pair of "Nonpariels." By the help of a telegraphic friend she and her husband soon learned to communicate deftly with each other, sending down instructions to the servants and superintending household matters generally without the inconvenience of travelling too frequently up and down two flights of stairs. Bridget and Mary, of the lower regions, had watched this mysterious operation with considerable interest, and, as the event proved, had settled upon a theory of their own as to the *modus operandi* of the concern—at all events they evidently considered that it was not altogether a safe thing to have in the room under certain contingencies.

One evening Patrick and Michael had paid a visit to the aforesaid handmaidens, and the quartette had remained in close conference with closed doors until a late hour. The next morning Mrs. Moore discovered the "Nonpariel" carefully covered over with a cloth, and nicely tucked in around the edges! At first she was naturally astonished at such unprecedented caretaking, but when the truth flashed upon her that the unoffending instrument had merely been *blindfolded*, so that it couldn't see what was going on and report it to the "missus" up stairs, she laughed till she well nigh went into convulsions! So do her friends when she tells them the story, and small blame to them.

A Telegrapher Recovers Judgment Against a Railroad Company.

It has for obvious reasons become a figure of speech to say, when a thing seems difficult of achievement, that it will be about as easy to accomplish it as to get judgment against a railroad company. Singular as it may seem, judgment against a railroad company has been recently obtained, and by a telegraphist, too—and of the feminine persuasion, moreover. In the Supreme Court, at Providence, R. I., before Mr. Justice Potter, June 22d, Miss Nelana Brown sued the Providence and Worcester Railroad Company for \$1,113.27, for her services as operator at Waterford, Mass. She alleged that the defendants agreed to give her twenty-five dollars a month, with "extra," until her entire compensation should amount to forty dollars per month; and that afterwards the Western Union Company established an office at the station, and the defendants then agreed to make up to her the difference between her receipts from the telegraph company and forty dollars per month. The defendants contended that they agreed at first to give the plaintiff only \$25 per month, and after the telegraph company opened an office to pay her the difference between her receipts there and \$25 a month, which latter sum was subsequently raised to \$37.50, and finally to \$40. A verdict for the plaintiff, however, was given, as intimated above, and Miss Nelana Brown goes into the country with \$1,113.27 of the railroad's dividend money.

Uncle Jim's Dog.

OLD "Uncle Jim," as everybody called him, who lived at one of the stations along the Pennsylvania Railroad, was the unhappy owner of such a beast. Uncle Jim had a kind heart, and he couldn't bear to take that animal out and drown or shoot him, or take him in and cremate him. He counselled with the telegraph operator, and that ingenious youth proposed a plan. It was that they tie the dog's legs together and throw him into a passing train. A freight train went by that evening at seven, and the wretched cur, yelping and howling, fastened together like a ball, went by in it. Uncle Jim retired early, satisfied that he had seen the last of the dog. The telegraph man did not go to bed so early. He watched for the arrival of the express, due at eleven P. M., and which came from the same direction towards which the freight with the tied-up dog had gone. Shortly after eleven the telegraph man might have been seen, had anybody been awake to see him, slowly wending his way towards the residence of Uncle Jim. He held in his hand a rope, and at the end of the rope was a dog—in fact, Uncle Jim's dog; for that wicked telegraph man had sent a despatch up the country early in the evening.

This was the despatch:

"Operator at —: Some scoundrel threw Uncle Jim's dog on the freight with his legs tied together. Send him back by the express."

When Uncle Jim awoke next morning, after joyful dreams of happy dogless days, he took a walk in the garden. Suddenly Uncle Jim became profane. He heard a familiar sound, and has seen a familiar form. His dog is by his side. He went down town to ruinate some more. He told the telegraph man, and the telegraph man said innocently, "Well, I never!" Uncle Jim shot the dog, and when he found out how it was, he wished he had shot the telegraph man.—*Philadelphia Press.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Origin of the Term "Plug."

ALBANY, OREGON, June 20.

TO THE EDITOR OF THE TELEGRAPHER.

YESTERDAY my eye met a paragraph *Switch-ed* from *The Plug*, giving its theory regarding the origin of its own name, which is also the name of that large and rapidly increasing class of human beings—suppose they are human, ain't they?—in whose interests the latter *verdant* hued paper is laboring so hard, in response to that plaintive and heartrending appeal from one of the "brave 300" employed on "Tpe 6ejhiit4a8ania R.R.," and who "Fr Vefart" appreciates so much better than "good opsrs."

Now, "Webfoot" has a theory which is *guaranteed* to be *correct*. I commenced the *art* of the dots and dashes, and *science* of the batteries—for it was a "science" to me *then*, after having taken 'em apart for cleaning to get 'em together again—under the guidance and supervision of "Doc Plummer," mentioned by *The Plug*. That was several long years ago, when Doc and Webfoot's father were together, under the firm name of "Rice & Plumber, Physicians and Surgeons" (no charge for advertising), dealing out physic in any desired quantities, and doing their "level best" to make the undertaking fraternity bless 'em forever. Many a long evening can I call to mind sitting around the office fire with a lot of the boys listening to "Doc's yarns," as they were termed; but when he would quietly turn round and remark, "Truth, now, boys," we knew it was so; and many a time have I heard him relate the circumstances mentioned by *The Plug*, which is, in the main, correct, only it omits one letter—"u."

Doc, "the light haired youth of sixteen summers," choose "P" as his *initial*, but the Supt.—DePew, I believe—used that, and informed the youth that he must choose some other letter, or—"forever hold his peace." Being thus vetoed, our youth then used "*Plu*," and the office call being "*G*," the complete word was made.

Doc has been for a long time, and still is Supt. at Portland, Oregon, and is to-day anything but what he "sined" when operator at West Greenville, Pa., in '51.

Anybody having "a more reliable theory" was invited to "come to the front" by *The Plug*. This has induced me to "cut in" with the foregoing, which, I trust, may be of interest to some of the fraternity, as I can vouch for its truth, even if it does come all the way from

WEBFOOT.

Duplex Telegraphy.

TO THE EDITOR OF THE TELEGRAPHER.

IN a late number of your contemporary, the *Journal of the Telegraph*, a correspondent gives a method of arranging an ordinary relay, so as to answer for duplex working on the differential plan, in cases of emergency, such as often arise from the regular differential relays being burned out by lightning, etc. The plan suggested is that of attaching the outgoing wire from the transmitting sounder, between the two helices of the relay, to the fine wire passing from one to the other, and then connect the line to one of the main binding screws, and the short or rheostat circuit to the other. The editor prints this with an illustrative diagram, and then proceeds to "sit down" on the aforesaid contributor, by informing him that his plan was invented two or three years ago by Mr. Stearns and tried with success on the line between New York and Albany. If our learned friend had examined the original patent of Mr. Stearns, taken out in 1868, he would have found this plan carefully described therein, and equally carefully disclaimed, the credit thereof being given to Siemens and Halske, of Berlin; and, in fact, many of the published works of a dozen or twenty years ago and since show it in that shape, among which may be mentioned the well known work of Mr. Sabine, familiar to most American telegraphers. In point of fact, this arrangement was invented by Siemens in 1849, or not less than a quarter of a century ago. In justice to the *Journal's* contributor it ought to be stated that he doesn't lay claim to the invention for himself.

The headlong manner in which our friends of the *Journal* rush forward to claim every invention in duplex telegraphy, ancient and modern, in behalf of Mr. Stearns (since the Western Union bought his patent, not previously) is inexpressibly funny to those who are well up in the history of the subject, and are thus enabled to see the whys and wherefores of things. The next thing will be the automatic, which is already reported to be in rehearsal, and then look out for more fun.

ONTARIO.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JULY 4, 1874.

THE TELEGRAPHER:

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Bound Copies of Volume IX for Sale.

WE have a few copies of Volume IX of THE TELEGRAPHER, handsomely bound, which may be obtained, if applied for soon, at Five Dollars per copy. The number of these is very small, and those who desire to get them must apply soon, or the opportunity will be lost, as, once disposed of, we cannot duplicate them—some numbers of that volume having been exhausted.

The Fourth of July 1776 and 1874.—Progress and Improvement since the United States became a Nation.

AS THE present number of THE TELEGRAPHER appears on the anniversary of the nation's birthday, it may not be inappropriate that we should improve the occasion to call attention to the immense advance which has been made since the time when the Declaration of Independence, proclaimed at Independence Hall, Philadelphia, marked the creation of a new nation, destined to effect such a momentous change in the history of the world. It is neither our province or purpose to descant upon the patriotic devotion to liberty and independence, then or since, of the American people, although these have been abundantly displayed in resistance to tyranny and oppression upon many a hard fought battlefield, some of which are yet fresh in the recollection of the present generation.

When the Declaration of Independence was made, in 1776, there were in the provinces which united in it some 3,000,000 of inhabitants. These have, in less than a century, increased to 40,000,000. But a small portion of our territory was even partially settled, and a considerable part of that now included in our territorial limits was then really or nominally under other governments, and an unbroken wilderness in which no white man had ever set foot. Steamboats and railroads were unknown, and the electric telegraph undreamed of. Even in the most thickly settled sections of the country communication was slow and difficult, and the dissemination of news and information, which is now accomplished almost instantaneously, uncertain, and requiring days, weeks and months even.

The steamboat first showed the possibility of a better state of things, and its invention and development was the result of the demands of a rapidly increasing and enterprising people. This was in its day

regarded as a most wonderful invention and display of inventive genius, and was even for some time regarded as visionary and impracticable. After some years the locomotive was invented and railroads became practicable. By this time the public had become accustomed to steam power in the navigation of inland waters and on the coast, but little faith was displayed in what was then regarded as the wilder and more impracticable schemes of dreamers and visionaries, of substituting steam for the propelling powers of the horse and mule, hitherto regarded as the swiftest and most practical means of transportation on the land. These visionaries, however, adhered to their folly, and in due time the practical portion of the people conceded their wisdom, and the railroad gradually demonstrated its value as a civilizing agency.

But a greater wonder than the steam engine and locomotive was yet in reserve, and one even more potent as an agent of civilization and progress. This was the electric telegraph, which, after years of scientific research, and as the combination of the studies and discoveries of many studious and learned men, was, in spite of the derisive and ridicule with which the idea was at first received, demonstrated to be a practical and incalculably valuable agency. We do not propose to trace its progress and development from the crude and imperfect form in which it was first attempted. This has been so often done that the story is familiar to us all. Its development, slow at first, as must always be the case with important inventions and improvements, has, in this country, progressed so rapidly that it is sometimes difficult for those of us even who are and have been intimately associated with it, to realize it. Not only is every part of this great extent of territory in instantaneous connection with the whole country, so that events occurring in sections thousands of miles apart are simultaneously known, but even the most ordinary and common transactions of daily life are carried on and facilitated by its means. The dealings in and quotations of merchandise, bonds and securities of all descriptions, are instantly reported and made known to parties interested; places of business are connected by private telegraph lines and instruments; messengers are called for and despatched at brief telegraphic notice; the occurrence of conflagrations notified automatically, and those whose business it is to extinguish them before they have gained headway are summoned, not only to the locality, but informed of the very room in which they originate; the fire departments of great cities are rendered vastly more efficient, and constantly new applications of this infinitely valuable, useful and efficient agency are made, so that no one can tell to what extent it may be made available.

Vast as is the present territory of the United States, extending from the Atlantic to the Pacific Ocean, it is, in fact, owing to the agency of steam and electricity, more homogeneous, and the different sections more intimately associated and connected, than was possible with the comparatively limited territory which comprised the original thirteen States. The most enthusiastic of the revolutionary patriots, and the wildest dreamers of that period, could have no conception of the future which steam and electricity would give to the nation at whose birth they assisted. We, their descendants, at this recurrence of the glorious anniversary of our nation's nativity, may well be proud of what has been accomplished, and look forward with sanguine anticipations of what yet may be in store for us. Time and distance have been annihilated, the marvellous achievements of even a recent time have become the familiar every day performance of the present.

Looking outside of our own territory, extended as it is, we see even greater marvels. Thousands of miles of ocean have proved no barrier to the triumph of steam and electricity. Great steamers plough the waters of every ocean, and in spite of winds and waves, have reduced to a comparatively brief period the time required to effect a transit from shore to shore. The electric cord binds continents and islands together, and from

the furthest east to the remotest west places all nations and people in instantaneous connection with each other. Europe and the British Isles are to-day practically less distant from us than in 1776 were localities in our own country a thousand miles apart. Daily and hourly are we informed of what is transpiring in all quarters of the globe, so that India, China, and all peoples and nations have, in fact, become our neighbors, and we know of and can sympathize with them in their joys and sorrows, their successes and tribulations. Steam and electricity are, indeed, the Archimedean levers which move the earth and make one all nations which dwell upon it.

We can see and realize what a century has accomplished. We cannot see or realize what another century may effect, but may look forward with hope and faith that the work which has progressed so rapidly will be prosecuted until even greater results have been attained. The world indeed "does move," and all attempts to impede its progress must prove futile. We have faith to believe that eventually steam and electricity will put an end to wars, and that the immense masses of men whose lives and energies are now wasted in armies and navies will contribute by their intellect and labors to the advancement of the welfare and comfort of the human race, and that through their agency the sword shall be beaten into a ploughshare and the spear into a pruning hook. When this has been accomplished, then, indeed, may we look for the millennium to commence, and our descendants may celebrate with renewed and ever increasing energy and appreciation the glorious anniversary of our national independence.

Resignation of Postmaster General Creswell.

IMMEDIATELY upon the adjournment of Congress Postmaster General CRESWELL sent to the President his resignation, which was accepted by the latter in a very complimentary letter to the retiring official. Mr. EUGENE HALE, of Maine, at present a representative in Congress from that State, was tendered the appointment and accepted it, and entered upon the duties of the office on the first instant.

The active efforts which have been made by Mr. CRESWELL to obtain a transfer of the telegraphs of the country to the Post-office department, and his failure to accomplish it, will serve to render his administration memorable in telegraphic annals. What the views of his successor are upon this subject we are not fully informed as yet; but it is not probable that, knowing as he does the disclination of Congress and the people to assume such a burden, that he will make it a special purpose of his administration to secure it.

Aside from his course on the telegraph question, Mr. CRESWELL has made a very efficient Postmaster General. If he has failed to secure the management of the telegraphs, his administration of the department has been signalized by the abolition of the franking privilege, and many other important reforms have been introduced during his term of office. The office of Postmaster General, if properly administered, is the most laborious, and the labors of its occupant are the least appreciated of either of the Cabinet officers. The business of the Post-office department brings it intimately and constantly in contact with the whole body of the people of the country, and its head is held more directly responsible by the public and by the members of Congress for any real or supposed defects, errors, or shortcomings, than any other member of the Government. It is an arduous, and, to a great extent, a thankless position, and one which we should suppose would be considered anything but desirable, under any circumstances, and much less so if the difficulties and perplexities of the telegraph were added to those which are already inseparable from it.

Telegraphic Reminon.

THE annual reunion of the telegraph operators along the line of the Erie and New York Central Railroads takes place to-day at Rochester, N. Y. Those who have been so fortunate as to be present at those which

have been held heretofore have enjoyed the occasion very much, and we have no doubt but that which takes place to-day will be fully equal to any which have preceded it.

Progress of the New Lines of the Atlantic and Pacific Telegraph Company.

THE Atlantic and Pacific Telegraph Company has recently constructed a new line from Springfield to Athol, Mass., a distance of about sixty miles, and it is now in operation.

The new line of this company from Chicago to Omaha is making very good progress, and will be completed within the contract time. This work is being done under the personal direction and supervision of Mr. GEO. H. BLISS, of Chicago. BROOKS insulators are used, as has already been stated in THE TELEGRAPHER, under a contract with Mr. BROOKS to maintain the capacity of the line in the most unfavorable weather at a high standard.

The Atlantic and Pacific Company is exhibiting much energy and enterprise in extending and increasing its facilities, even under the existing dulness and business depression.

Hon. Eugene Hale Declines the Office of Postmaster-General.

HON. EUGENE HALE, of Maine, whose appointment to and acceptance of the office of Postmaster-General we mention in another article, on Wednesday last withdrew his acceptance, and Mr. CRESWELL continues to act in that capacity until his successor can be determined upon and is qualified.

It is understood that Mr. HALE withdrew his acceptance of the position on account of his health.

Tillotson & Co. as Advertisers.

WE have often had occasion to refer to the enterprise and liberality of Messrs. L. G. TILLOTSON & Co. From the first issue of THE TELEGRAPHER to the present number they have availed themselves constantly of its columns to make known their ability to supply every article that can be called for in their line. The money expended in this way has proved an excellent investment, as their large and lucrative business in telegraph and electrical apparatus and supplies has very satisfactorily demonstrated. With ample capital and facilities, and an excellence of manufacture which is maintained under all circumstances, it is not surprising that theirs should be the leading house in the trade. Besides their extensive telegraph business they have an endless assortment of every article required for railroad purposes, and, no matter how dull may be the season, No. 8 Dey street is always a busy place, and TILLOTSON is always on hand to cheerily greet the numerous customers which throng his establishment.

F. L. Pope & Co. and their Specialties.

THE specialties which have been introduced by Messrs. F. L. POPE & Co. during the past three years have been received readily and thoroughly appreciated. They were the first to introduce the cheap telegraph apparatus for learners, amateurs and short lines, and the fact that at the present time their instrument, improved as it has been from time to time, maintains its position in the market and is sought after by purchasers, guarantees its superiority and excellence. Their metallic battery also has met a want which had long existed, and is rapidly growing in popular estimation and appreciation. Besides this, they offer a stock of telegraph instruments, insulated wires, etc., which is well worth the attention and patronage of purchasers. Their new circular and price list should be in the hands of every person who has occasion for anything in their line, and will be forwarded on application, or may be obtained on personal application at their place of business, No. 38 Vesey street.

Personals.

Mr. FRANK H. BROWN, late manager of the Southern and Atlantic Telegraph Company's office at Savannah, Georgia, is requested to put himself in communication with Mr. G. H. GRACE, General Superintendent, Macon, Georgia.

Mr. A. R. CARY has accepted the position of night operator at Tilsonburg, Ontario, with the Canada Southern Railway.

Mr. C. W. GEARHART, the well known and efficient telegraphic artist, has received an appointment at Maricopa Wells, Arizona, on the military telegraph line.

Mr. C. W. ROTHROCK has been appointed operator and assistant agent, Lehigh Valley Railroad office, at Mahanoy City, Pa.

Mr. D. B. MITCHELL, of the Western Union office at 145 Broadway, New York, has gone for a brief sojourn among his friends at Toronto, Canada.

Mr. E. C. BOILLEAU, late of the Western Union Washington, D. C., office, has accepted a position at 145 Broadway, New York, *vice* Mr. E. S. RISDON, transferred to the Duxbury, Mass., office of the same company.

Mr. P. V. DE GRAW, late of the Western Union Washington, D. C., office, has accepted a position with the same company at No. 145 Broadway, New York, on the night force, *vice* Mr. DENNIS HARMON, transferred to the day force.

Mr. FRED. N. COOK, mentioned in this column as having changed his base from Providence, R. I., to Worcester, Mass., has been induced to keep his faith pinned on the Franklin Company, and still reposes his trust in Providence.

Mr. HENRY S. KNAPP, of the Western Union office at 14 Broad street, New York, has been appointed District Deputy Grand Master of the Masonic Order for the Third District, which embraces Brooklyn and Kings County, excepting the Eastern Division of Brooklyn.

Mr. JOHN F. WALSH, of the Thirty-fifth District of the American District Telegraph Company, has been appointed in charge of delivery at the Grand Central Depot.

Mr. FRANK SMITH, manager of the Twenty-fourth District of the American District Telegraph Company, has resigned.

The Telegraph.

By Cable.

CONGRATULATIONS ON ANGLO-BRAZILIAN CABLE.

LONDON, June 26.—Queen Victoria and the Emperor Dom Pedro have exchanged congratulatory messages upon the successful laying of the Brazilian cable.

Congratulations Exchanged between the Emperor of Brazil and the President of the United States on the Completion of the Anglo-Brazilian Cable.

JUST before leaving Washington for his trip to Virginia, on Thursday of last week, President Grant received the following despatch by cable from the Emperor Dom Pedro:

TO THE PRESIDENT OF THE UNITED STATES.

The inauguration of the electric telegraph between Europe and Brazil, which also unites us to the Republic of the United States, is a cheering sign of improved international relations, as also a bond of friendship and a powerful instrument of civilization.

I congratulate my great and good friend, the President of the United States, upon this happy event.

DOM PEDRO, Rio de Janeiro.

PRESIDENT GRANT'S REPLY.

EMPEROR OF BRAZIL, Rio de Janeiro.

I congratulate you upon the telegraphic connection just established between Brazil and the United States. May it prove as close a link in national friendship as in communication.

U. S. GRANT.

The New Atlantic Cable and the Atlantic and Pacific and Franklin Telegraph Companies.

UP to the time at which this is written the new cable steamer *Faraday* had not arrived at Portsmouth, N. H., although she is several days overdue, having sailed from Halifax, U. S., on the 14th June. Her arrival is hourly expected, and should she make her appearance before THE TELEGRAPHER goes to press the fact will be stated.

The steamer *Ambassador*, with the shore end of the cable, is still at Portsmouth, in the lower roads, await-

ing her arrival. As the *Faraday* has the small boats and steam launch which are to be used in laying the shore end, the cable on board the *Ambassador* cannot well be laid until her return.

The Atlantic and Pacific and Franklin Telegraph Company, which has the contract for connection with the cable at its landing place at Rye Beach, are engaged in the construction of the additional lines required to establish the necessary connections with the system of telegraphs competing with the Western Union Company and the companies included in its combination. Wires connecting with the cable are to be built reaching New York by two routes. One line will be built from Rye Beach to Boston, connecting at Boston with a new wire which is to be put up on the poles by the shore line route. This line will follow the highway from Portsmouth to Boston, and will be about fifty-six miles in length. The other wire will go *via* Portsmouth, Haverhill, Lawrence and Lowell to Worcester, and from the latter city *via* the Springfield route to New York. By these two wires, besides connecting the cable by two entirely separate and independent routes to New York, all the important cities and towns in New Hampshire, and additional ones in Massachusetts, will be brought into the circuits of the competing lines. It is further proposed to extend the system of competing lines to Portland, and from thence to all important points in the east. Also, to construct, *via* Concord and White River Junction and St. Johnsbury, a new and independent route to Montreal, Canada, and Ogdensburg, N. Y., where it will connect with the existing line of the Atlantic and Pacific Company.

With these additions to existing facilities and others which are in progress, and the connections with Europe to be furnished by the new cable, there becomes practicable a new and powerful combination for press reports outside of that now existing between the Western Union Company and the Associated Press, and newspaper proprietors and managers will be rendered independent of that organization. This is an important matter for the press of the country, and one which has been fully and carefully considered in making the arrangements of circuits and locating the new lines to be built. The intention is to have every section of the country and every important point covered by the wires of the competing companies, and this seems to be in a fair way of accomplishment within a reasonable time. The Southern and Atlantic Company are extending to New Orleans, and, by the construction of and taking in lateral lines, will soon have the South, so far as the seaboard route is concerned, very well supplied with telegraphic facilities. It is expected that by the first of September next the cable will have been laid and will be in operation, and that a considerable portion of the land wires requisite to make the connections above indicated will be up and working.

The new lines to connect with the cable are to be constructed of No. 6 Compound Telegraph Wire, and Brooks' new patent insulators are to be used, and with these their capacity for business will be much in excess of ordinary iron telegraph wires with glass or inferior insulation.

Reported Loss of the Cable Steamer *Faraday*.

A PRESS despatch from Halifax, N. S., of the 1st inst., states intelligence received from Picton represents that the cable steamer *Faraday* struck an iceberg off Halifax and is a total wreck. No details of the disaster were given.

The Southern and Atlantic Telegraph Company.

IN order to expedite repairs, and give a more local supervision of wires, the lines of the Southern and Atlantic Telegraph Company have been divided into circuits, with what are termed circuit offices at Gordonsville, Va.; Charlotte, N. C.; Macon, Ga.; Columbus, Ga.; Selma, Ala.; and Mobile, Ala., by the General Superintendent, Mr. George H. Grace, whose headquarters are at Macon, Georgia.

The Economy of Good Insulation.

OVER twenty years since a plain, ungalvanized No. 10 wire was taken down from the turnpike in Ohio and Indiana by the telegraph company, and placed on the line of the Michigan Central Railroad. The resistance of this line was so great it was of little or no use in rain, and was finally turned over to the railroad company. The railroad company had difficulty in working their wires with a large number of relays in the circuit in rain. In 1868 the railroad company re-insulated with Brooks insulators their wires—two in number—from Detroit to Chicago. One was a galvanized No. 9, the other this plain old wire. It was the intention of the company to replace the old wire with new galvanized, but it was found that, with the new insulation, the old wire could be worked at full capacity in rain over three hundred miles, the entire circuit, when a new No. 6 wire upon common insulators, be-

longing to the telegraph company, was worked with great difficulty and at a very slow rate of speed. This old wire is still in use and doing good service, although the resistance is nearly one hundred units per mile.
Query.—How many thousands of dollars have been spent in replacing wires that would have done good service for years with good insulation?

The American District Telegraph Company.

THE American District Telegraph Co. at present deliver Western Union messages at the Nineteenth, Twenty-eighth, Thirty-first, Thirty-fifth and Forty-fourth Districts. On July first the company, in addition, assumed the delivery and joined forces with the Western Union Company at the Grand Central Depot, Forty-second street; Eighth avenue and Fourteenth street; Eighth avenue and Twenty-third street, and Fifteenth District, No. 397 Broadway.
 The dividing line between the Thirty-first and Thirty-fifth Districts has been changed from Twenty-fourth to Twenty-sixth street.
 The messengers appear to-day for the summer in Panama hats, at an expenditure of about \$5.

Foreign Telegraphic Notes.

THE traffic receipts for the month of May of the Great Northern Telegraph Company were 365,264 francs, against 328,797 francs for the corresponding month of last year. The total traffic receipts from January 1 to May 31 were 1,647,495 francs, against 1,184,486 for the corresponding period last year.
 The number of messages (of twenty words) passing over the Barcelona-Marseilles cable of the India Rubber, Gutta Percha and Telegraph Works Company, for the month ending May 31, was 5,478, against 4,067 for April.

Telegraphic and Electrical Brevities.

Mr. H. C. Bradford, the popular and efficient manager of the Western Union Telegraph Company, at Providence, R. I., is extending the line from that city to Rocky Point, the great summer resort of Narragansett Bay, to Oakland Beach, Rhode Island, a new watering place three miles from Apponang, on Greenwich Bay.
 Robert Dunning, an employe of the Western Union Telegraph Company, while watching a race in Fleetwood Park, Westchester, N. Y., from the top of a telegraph pole on the Harlem railroad, last Saturday afternoon, fell to the ground, a distance of about forty feet, sustaining serious internal injuries.

Miscellaneous.

CHEMIC ACID SOLUTION FOR BATTERIES.—The *Scientific American* says an improved recipe, by which a stronger current is produced, is as follows: 12 parts, by weight, potassium bichromate in 150 parts water, with the addition of 25 parts of sulphuric hydrate.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JUNE.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
25	71½ 74½	.....	.....
26	72½ 73½	.....	.....
27	73 74½	.....	.....
29	74½ 76	17 17	.....
30	74½ 75½	.....	.....
July 1	74½ 75½	.....	.....

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'u Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c
 UNIFORM TO ALL POINTS.
 Each add. word, 2 to 3 cents.
 PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

A MATEUR TELEGRAPH INSTRUMENTS.

Owing to the number of orders and the delays of manufacture I have been unable to meet the demands of the public, but am now ready to furnish my customers, and the public generally, with Nos. 1, 2 and 3, well finished and at very moderate prices.

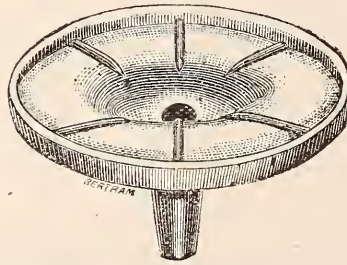
G. A. WESSMANN,
 544 NOSTRAND AVE.,
 Brooklyn, N. Y.

TO WHOM IT MAY CONCERN.

Mr. DANIEL H. CRAIG'S acts of bankruptcy dissolved my business relations with him, which I have declined to renew.

GEO. C. LITTLE, C. E.,
 Passaic City, New Jersey,
 U. S. A.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

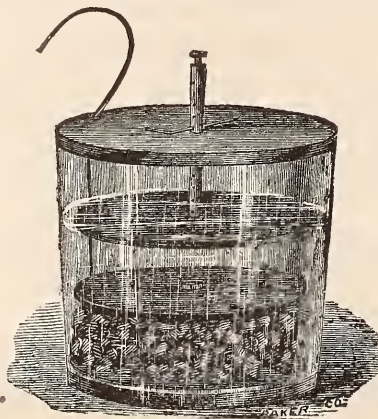
The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATIS & CO., Baltimore, Md.

Send for catalogue.

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Calland Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,
 41 THIRD AVENUE,
 Chicago, Ill.

PARTRICK, BUNNELL & CO.,
 38 SOUTH 4th ST., PHILA.,
 AND 22 DEY ST., NEW YORK,

MANUFACTURERS OF

UNRIVALLED MORSE INSTRUMENTS

CHAMPION LEARNERS' APPARATUS,
 with Complete Instructions, Battery, Wire, etc.,

GIANT SOUNDERS,

Improved Curved Keys,
 Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

ANNOUNCEMENT!

Messrs. PARTRICK, BUNNELL & CO.

herely announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

—AT—
 22 DEY STREET,
 NEW YORK,

where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL
 AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in
 CHAMPION LEARNERS' INSTRUMENTS,
 NEW GIANT SOUNDERS, PERFECTED,
 IMPROVED CURVED KEYS,
 ELECTRIC BELLS, IN GREAT VARIETY,
 NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED
 LIGHTNING ARRESTERS,
 LATEST AND BEST FORMS OF GRAVITY BATTERIES.
 Together with LINE WIRE,

OFFICE WIRE, BRACKETS,

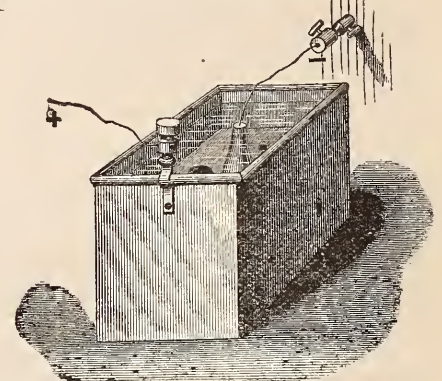
INSULATORS, LINE TOOLS, Etc.

Send for Catalogue and Price List.

PARTRICK, BUNNELL & CO.,
 22 DEY STREET, NEW YORK.

38 South Fourth Street, Philadelphia.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.)

38 VESNY STREET, N. Y.



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY** THE **BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times,

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

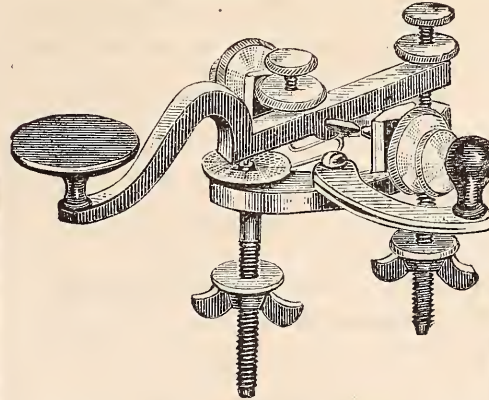
SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.

Acknowledged to be a decided improvement.
Price, same as the ordinary key.

Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR CLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

THE BEST TELEGRAPH MATERIAL
IN THE WORLD
AT THE LOWEST PRICES!

The prices on our Catalogue are very low, but we are offering 20 per cent. discount from them on all Telegraph Instruments of our manufacture.

L. G. TILLOTSON & CO.,
8 DEY ST., N. Y.

THE "SNAPPER" SOUNDER.



NEW STYLES, NEW PRICES.

TRADE MARK "SNAPPER,"
PATENTED MAY 12, 1874.

The unexpected and growing demand for the original "Snapper" Sounder, beyond the expectations of the manufacturers, has delayed the introduction of proposed styles and improvements.

Having increased our facilities and accumulated sufficient stock to enable us to fill orders promptly, the following varieties are now offered for sale at prices which will accommodate all classes.

The "Snapper" Sounder, plain.....30c. 6 for \$1.50.
" " " nickel plated spring... 0.40.
" " " or 6 for..... 1.80.

A few were manufactured to order with hard rubber knobs. They were so well liked that I have decided to introduce them to the fraternity. The springs are secured by two screws, and, should they break, may be replaced at an expense of 15 cents. They are thoroughly made and finished.

PRICE, 75 CENTS.



To the Dominion 5 cents each extra.
A liberal discount to agents.

R. W. POPE,
Box 5278, New York.
F. L. POPE & CO., 38 Vesey Street,
Agents for New York City.
SMITH & HALL,
Montreal Tel. Co., Hamilton, Ontario.
Agents for Canada.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and KEY on same base, making an elegant set.
WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
WESTERN UNION (new style) SWITCH BOARDS.
ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR
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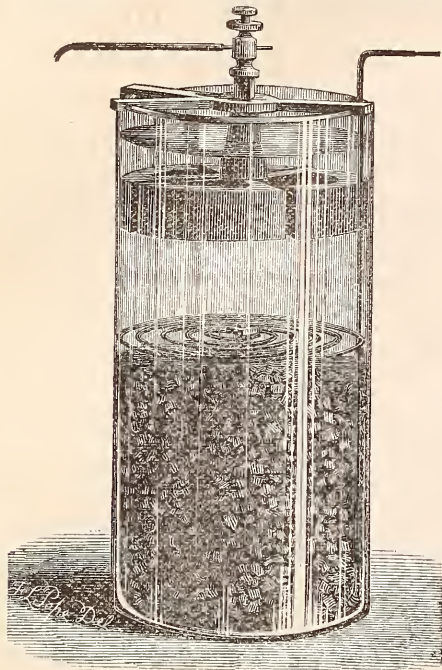
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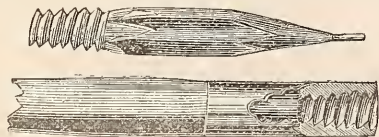
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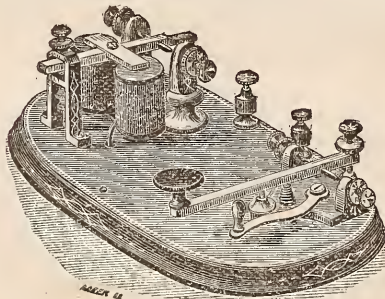
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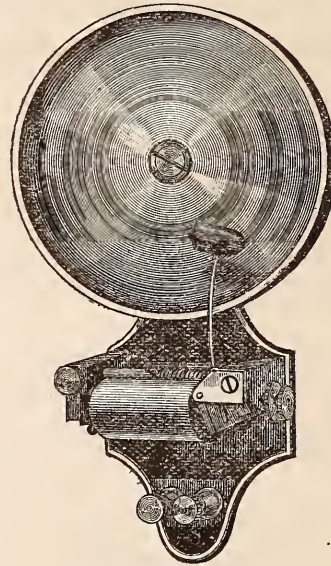
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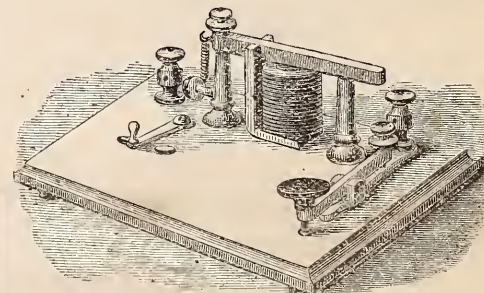
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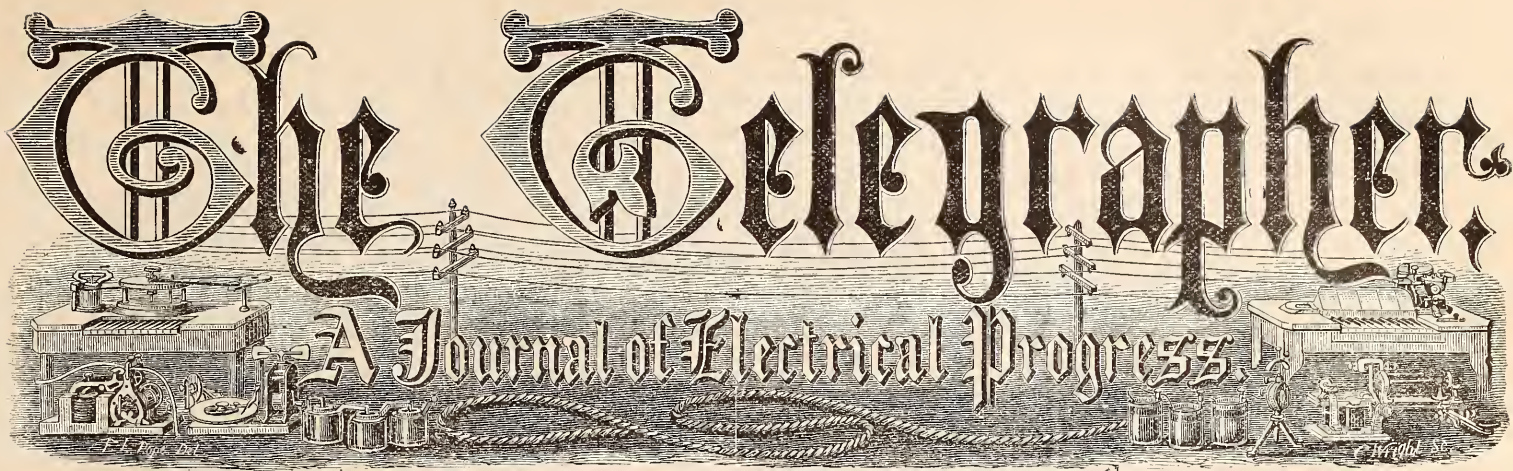
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The Telegrapher

A Journal of Electrical Progress



Vol. X.

New York, Saturday, July 11, 1874.

Whole No. 417

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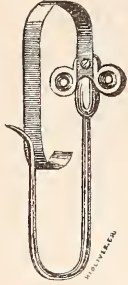
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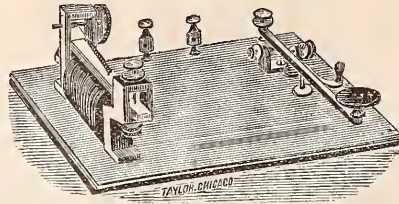
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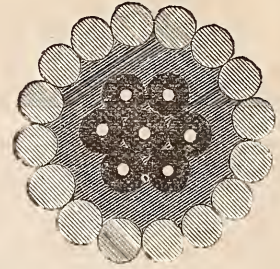
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JULY 11, 1874.

VOL. X. WHOLE No. 417.

Original Articles.

"A Duplex Review" of the English and American Systems of Automatic Telegraphy.

By GEORGE LITTLE,

Consulting Electrician to the Automatic Telegraph Company, Inventor of and Patentee of the American Automatic Telegraph System.

ENGLISH SYSTEM. AMERICAN SYSTEM.
WHEATSTONE'S. LITTLE'S.

Professor WHEATSTONE asserted in his paper, published in the *Philosophical Transactions*, "On the Laws which Regulate the Transmission of Electric Currents," that the *Speed of the English automatic system of telegraphy depends entirely upon the rate at which successive currents of electricity can be transmitted through a conductor without coalescing*. He fixed this limit of speed on fifty miles of line to be, for practical business, equal to twelve hundred letters (not words) per minute, and that in practice one English automatic wire was found to represent three Morse wires.

Mr. Culley, the Engineer in Chief of Her Majesty's Postal Telegraph Department, says that the Wheatstone automatic system, as it is at present employed by the post-office, in its telegraphic correspondence between London and the principal cities, works at a speed from twenty to one hundred and twenty words per minute. But when the land line is increased to *three hundred miles*, with sixty miles of cable in the circuit, the speed will be only from *forty to eighty words per minute*.

Sir Charles Wheatstone's method of manipulating the electric currents, in the operation of his automatic system, consists in the alternating of reverse currents, in order to reverse the polarity of the electromagnets, and thereby set in motion polarized armatures, connected with the receiving instruments.

And, in addition, to compensate for loss of current to earth, brought about by the introduction of an artificial resistance equal to or more than the rest of the entire circuit at the receiving end of the circuit, between the receiving instrument and the end of the line (especially a cable), interpolating or compensating currents are made to pass to the line direct, through a high resistance, to increase or diminish the strength of the operating current. Thus,

I WAS about the same time, namely, 1869, following up my experimental investigations in relation to the then supposed insurmountable difficulty (as demonstrated by my distinguished countryman, Sir Charles Wheatstone), and which resulted in the discovery and introduction by myself (among many other salient features) of what I designate the *overflow dam*, at the receiving end of a line of automatic telegraph, whereby the speed was increased for all practical business purposes (as Mr. Prescott, the electrician of the Western Union Company, said of the *Bain* system in 1870, of from fifty to sixty words per minute on one hundred miles of line) up to (as the Hon. William Orton, the President of the Western Union Company *conceded* in January, 1873,) thirty-six thousand words per hour on about three hundred miles of line of one wire, by my system (over sixty thousand words has been transmitted in one hour over the same line of one wire)—an amount of work which would require at least *sixteen* Western Union Morse wires, together with *thirty-two* expert Morse operators to transmit and receive in the same time.

The Hon. George Harrington, the President of the Automatic Telegraph Company, in his official circular of March 10, 1872, says this great desideratum has been accomplished by Mr. George Little, whose method of manipulating the electrical currents permits telegraphing to be done automatically, and reduces the demand for capital and the current expenses to a minimum, with results of *immense magnitude* (at the same time doing away with the defects of the Morse instrument, that may be interpreted by any Morse expert by feel, taste, or by sound).

Twenty years since Bain obtained forty to sixty words per minute on (as Mr. Culley says) lines of about sixty to seventy

to work the Wheatstone's automatic system direct, the line has to be manipulated with four independent currents.

In the English automatic system *electro-magnets* are employed, which not only *reduces speed*, but necessarily involve so many compensating currents that the utmost speed, under extraordinary conditions, obtainable by that system, is *admitted officially* as one hundred and twenty words per minute on very short lines of say fifty miles.

Wheatstone has been more than twenty years working out his problem in automatic telegraphy.

In the application of the *Stearns duplex system* to the English automatic system, in order to work both ways over the same line wire, the result would be to double up all of the before named complications, and thereby render the same practically useless. But, assuming the speed to be increased thereby up to one hundred and sixty words per minute on fifty miles of line (which is all it would be in *theory*), all such attempts must be looked upon (as remarked by that eminent electrician, Mr. Sabine) as little more than "feats of intellectual gymnastics."

Quite recently a distinguished *Scottish writer* on this subject of automatic telegraphy, after careful inquiry, undertakes to say (I quote his own words), "But if we had done much to establish telegraphy as a practical and useful art, it remained to another country (*America*) to furnish that link in the chain which has rendered the system *universal*."

It is officially admitted that the working of my American automatic telegraph system in Great Britain has also been attended with "*success*."

May my fellow citizens of the United States reap its benefits in common with all *nationalities*. The venerable Professor Morse predicted (shortly before his demise) that there must be a *change*.

Without drawing invidious comparisons, it is now, after over two years of constant working in all weathers, day and night, between Washington and various other important cities of the United States, safe to assume that the American automatic telegraph system—inexpensive, progressive and popular—will be the system of the future.

An eminent electrician in Her Majesty's Postal Telegraph Department, writing to me under date of February 10, 1874, says, " * * * We in England are watching with much interest the characteristic growth and advancement of telegraphy in *America*, and we are quite willing to learn and to be taught."

Passaic City, New Jersey, U. S. A.,
July 4, 1874.

The Laws of Derived Circuits.

A CORRESPONDENT puts the following question, which he says was suggested by reading one of my articles on Electrical Measurement. He writes: "Why does a short circuit cut out a magnet? If we have two circuits from the same battery, one having 10 and the other 100 ohms resistance, would not the current in each be the same if the other was broken; and if not, why not? Of course, it is conceded that the 'quantity' of the battery is limited by its own powers of solution of its materials, but the question is confined to cases within such limits." The writer of the above is far from being the first person who has been puzzled by the above matter, and for the benefit of all interested I will try to explain the laws of the electric current in their application to this case, in as clear and concise a manner as possible. The laws concerned therein are two in number:

I. The effective force of current traversing any closed

miles in length; then Bain had recourse to that stumbling block in the way of fast automatic telegraphy, the electro-magnet, in order, as he supposed, to bridge over the difficulty of its application to long lines, and be found his speed cut down in consequence to the ordinary Morse standard.

But "*Notatu dignum*," all honor to my British fellow countryman for the first inception of automatic telegraphy. "*He who rules all things rules well*."

In the American system one current only, by peculiar manipulation, being required to manipulate the same at *any speed* up to five thousand words per minute, according to length of line.

I have also been over twenty years working out my problem in automatic telegraphy.

By the application of Gintl's duplex system to the American automatic system, the speed could be increased (according to length of line) up to *seven thousand five hundred words per minute*. But owing to the great length of lines operated in this country, together with the ever varying climatic conditions, it would be highly imprudent to attempt to work any automatic system both ways over the same line wire, while at the same time it would be quite useless in a practical point of view.

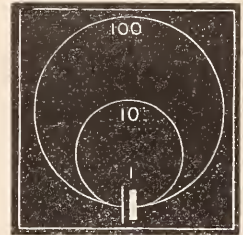
circuit is found by dividing the total electro-motive force by the total resistance of that circuit.

II. When an electric current divides itself between two parallel or alternative routes, the fraction of the total current passing through each route will be directly proportionate to the conductivity of that route, and therefore inversely proportionate to its resistance.

I will answer the questions of my correspondent first, and then endeavor to explain the reasons why.

A short circuit does not, under any circumstances, absolutely cut out a magnet. There is always a small portion of the current still traversing the helices of the magnet, though far too little to have any appreciable effect on it, unless observed with very delicate apparatus, the reason of which is obvious from the second law.

When two circuits are connected with the same battery, the current in one circuit is always *increased* by breaking the other circuit. If the "quantity" of the battery were *infinite*, or, more properly speaking, if it had absolutely no internal resistance, the opening and closing of one circuit would not affect the current of the other. It is not possible in practice to have a battery absolutely *without* internal resistance, and, therefore, the opening and closing of either circuit must affect the other to some extent. The less the actual resistance of the battery the less the effect will be, and *vice versa*. By applying the laws above enunciated, the reason why this is so may be ascertained.



The diagram represents a battery, to which are connected two closed circuits having respectively 10 and 100 ohms resistance. We will suppose first that the battery is absolutely without internal resistance (which, as above stated, is an impossible condition in practice), and that its electro-motive force is 1 volt, although for the purposes of this article it does not matter how great or how small the latter is assumed to be. If the shorter circuit *only* is closed we have then an electro-motive force of 1, divided by a resistance of 10, giving us a current represented by the fraction 0.1. Opening the shorter circuit and closing the longer we have an electro-motive force of 1, divided by a resistance of 100, giving a current of 0.01. If now we close both circuits, what is the joint resistance of the two? It is obviously not the sum of the two, because it is not to be supposed that the addition of an alternative route could by any possibility increase the resistance of the one already existing; neither can the true joint resistance be found by subtracting one from the other, for if this were the case, and each route had a resistance of 100, the joint resistance would be nothing, which is absurd. The true rule is to divide the product of the two resistances by their sum, and the quotient is the joint resistance. The truth of this rule is abundantly verified by actual measurement with a galvanometer. Applying this rule to the case in hand we have $10 \times 100 = 1000 \div 110 = 9.09$ (the joint resistance of the two circuits).

By the first law the total current flowing from the battery will be found by dividing 1 by 9.09, and will, therefore, be 0.11. By the second law this will divide between the two circuits inversely as their resistances; therefore the current of the long wire will be 0.01 and that of the short wire 0.1, exactly the same as when they were separately attached to the battery. So we see that, with no resistance within the battery, it makes no difference whatever in the current of one circuit whether the other circuit is closed or not. Now, let us suppose the battery to have an internal resistance of 1 ohm, and then calculate the results in the same way. The short wire alone gives $1 \div (10 + 1) = .0909$, and the long wire alone gives $1 \div (100 + 1) = .00918$. Now, if we close both wires at once, the joint resistance of the two is the same as before, 9.09, to which we must now add the 1 ohm in the battery, giving a total resistance of 10.09 ohms in the whole circuit. The current leaving the battery will now be equal to 1 divided by 10.09, which is .00991 according to the second law; one eleventh of this current, or .00901 takes the longer circuit, and ten elevenths, or .0901, the longer circuit.

Therefore, with 1 ohm resistance in the battery, we get the following result for the long wire:

With short wire open..... .00918
" " closed..... .00901
And for the short wire,
With long wire open..... .0909
" " closed..... .0901

The practical result of this is, that the less the inter-

nal resistance of a battery the more wires can be worked from it without materially interfering with each other. Thus a Grove battery, the resistance of which is not half an ohm per cell, will carry 40 or 50 telegraph lines, while a gravity battery, with a resistance of 4 or 5 ohms per cell, which is eight or ten times as much as the Grove, will not carry more than 4 or 5 such lines, as practical telegraphers abundantly proved by experience long before the true philosophy of it was generally understood. If the above explanation is not perfectly clear I will be happy to answer any further questions to the best of my ability.

F. L. POPE.

Elizabeth, N. J., July 6, 1874.

The Associated Press, the Central Pacific R. R. Co. and the Telegraphs.

THE California newspapers belonging to and not included in the Associated Press are very bitter and aggressive in their attacks upon one another, the Associated Press and the Central Pacific Railroad. A short time before the adjournment of Congress a despatch was published in the San Francisco *Bulletin*, intimating that the House Committee was bribed to defeat an investigation of the Central Pacific Contract and Finance Company's affairs. This company occupied a somewhat similar position to the Central Pacific that the Credit Mobiliere did to the Union Pacific Railroad Company. The *Los Angeles Herald* denounces this despatch as false, and charges that it was manufactured for the purpose of intimidating the committee by the General Agent of the New York Associated Press. Mr. J. W. Simonton, who is also a part owner of the *Bulletin* and *Call*. It proceeds to give the following explanation of the relations of the different parties in this matter, and the motives which actuate them: "The general reader has noticed the Associated Press despatches are always antagonistic to the Central Pacific Railroad Company, but it is not every one that understands the motive which prompts this antagonism. It is this: The railroad telegraph lines destroyed the news monopoly so long held by the Associated Press. The Pacific Coast Associated Press is composed of the San Francisco *Bulletin* and *Call* and the Sacramento *Union*. These three papers are the bitter enemies of the Central Pacific Railroad Company. But for the telegraph lines built by that company these three papers would hold a monopoly of Eastern telegraphic news, and no other journal on the Pacific coast could or would obtain a line or word of Eastern report until after it had appeared in their columns. * * * The Atlantic and Pacific Telegraph Company using the railroad wires have practically destroyed the Associated Press monopoly, and not only furnish other journals with fresh news, but have caused a reduction of one half in the subscription price of the old monopoly papers. * * * If Governor Stanford would refuse to allow the use of his wires for the transmission of news despatches or lease his lines to the Western Union, the Associated Press would have nothing to say against the Central people, and the three papers we have named would soon forget all about the Contract and Finance frauds."

Telegraphic Base Ball Match.—The Dashes again Victorious over the Dots.

THE return game of the Dashes Base Ball Club, of Cleveland, Ohio, with the Dots Base Ball Club, of Buffalo, N. Y., to which reference was made in the last number of THE TELEGRAPHER, came off at Buffalo on the Fourth of July, and resulted in another triumph for the Dashes. These clubs are composed of employés of the Western Union Company at Buffalo and Cleveland. The following excellent report of the game is taken from the *Buffalo Express* of Monday last:

"The time for the game of base ball between the Dashes, of Cleveland, and the Dots, of Buffalo, was put down at 10 A. M. At 4 o'clock, Saturday morning, the Cleveland parties, some fourteen in number, arrived in the city, and were escorted by their Buffalo brethren to the Continental Hotel. There rest, refreshments and social converse were indulged in until the arrival of the 'busses, into which the whole party crowded, and were driven up to the grounds on the Park Front, near York street. Although it rained a little during the ride, at the time of their arrival at the scene of conflict the sun shone forth in a manner which augured for a favorable day. Both clubs were dressed in uniform, that of the Buffalo boys differing only in having blue and white instead of blue stockings, white shirts and pants being worn alike by both clubs. A large crowd witnessed the game, there being over five hundred persons present, with a small sprinkling of ladies. The Dashes are a muscular nimble set of players, and we heard it whispered that among their number could be found one or two of the famous Forest City Club. The particularly good playing of their catcher, who wore a monogram P. C. on his shirt, seemed to give the rumor credence. At any rate, we

are obliged to confess that, whatever may be the reason, the Dashes are a stronger and more experienced set of players than their friends, the Dots. From the first inning it was evident that the game was in the hands of Cleveland's representatives, and we may say, perhaps, that many on the grounds felt surprised that the score was kept as low as it was. The toss being won by the Dashes, the Dots went to bat and retired quickly with no tallies. The summary treatment thus shown them had a slightly demoralizing effect, and by means of loose fielding allowed their opponents to roll up ten tallies. In the second inning only one tally was obtained, but by the change of pitchers, succeeded in keeping the Dashes down to five.

"The Dots went to bat in the third inning somewhat calmed down, and taking advantage of a sky-scraper by Barker, and some loose pieces of fielding, succeeded in scoring six tallies. Interest in our boys now began to revive, and some applause greeted their success. Nevertheless, the Dashes came in and continued their lead with a run of seven. Then the Dots went to the bat. During this inning Greene made a splendid catch in centre field, and Hunter, who tore his 'impossible-to-run-about-withoutables,' laid off till the seventh inning for repairs. The Dots secured four tallies, and by crowding themselves down to work kept the score of their opponents down to the same figure. In the fifth inning the Dots went out with a goose egg, and by means of sharp play gave the inside a chance to make but one tally. A foul catch by Kendrick was loudly applauded in this inning, as was also a fly catch by Gurley in the sixth inning. Several double plays were made by both clubs during the game, and several opportunities to make them overlooked by both. From the middle of the game until the end the Dots kept the score of their opponents down much better than was at first expected they would be able to do. The catching and pitching of the Clevelanders bothered the Dots considerably; and yet we must commend the Buffalo boys for the pluck and courage they exhibited to the end of the game. Considerable wild batting was indulged in on both sides, as two or three black eyes and damaged hats will testify. The umpiring gave great satisfaction to both parties, while the spirit manifested by every one taking part in the game was good natured and friendly in the extreme. We append the score of the game:

DASHES.		R.	O.	DOTS.		R.	O.				
Bohn, p.	.....	4	3	Dolan, c. f.	.....	1	3		
Melton, r. s.	.....	2	4	Voas, l. f.	.....	2	3		
Jones, s.	.....	5	4	Dudley, s. s.	.....	2	3		
Hoffman, c.	.....	4	2	Lees, c.	.....	3	2		
Greene, c. f.	.....	2	5	Waud, 3d b.	.....	2	2		
Himman, 3d b.	.....	4	3	Davidson, r. f.	.....	2	4		
Fell, 2d b.	.....	4	3	Barker, 2d b.	.....	1	4		
Castle, 1st b.	.....	4	2	Karbach, r. s.	.....	1	2		
Hunter, r. f.	.....	2	3	Kendrick, p.	.....	1	4		
Gurley, l. f.	.....	4	1	Larish, 1st b.	.....	2	3		
Total	.....	35	30	Total	.....	17	30		
Innings	1	2	3	4	5	6	7	8	9	10
Dashes	10	5	7	4	1	0	4	0	0	4
Dots	0	1	6	4	0	0	0	4	2	0
Umpire	—Mr. C. F. Howard, of Essex B. B. C.										
Scorer for Dots	—Mr. Frank Kitton.										
Scorer for Dashes	—Mr. J. T. Hanford, of Cleveland.										
Time of game	—2 hours and 40 minutes.										

After the game both clubs returned to the Continental, where they sat down to a big dinner, and afterwards took in the regatta and balloon ascension. At Schenkelberger's Garden they found a cool entertaining place to pass the evening, after a day of unusual excitement and activity. Yesterday morning the Dots chartered the Maggie L. Wilson and took the Dashes and party down to Navy Island, and to Sheenwater to dinner. The 9 o'clock train last evening conveyed the Cleveland boys home, feeling that, though they had been victorious at a game of base ball, the Dots of Buffalo could not be beaten in the hospitable manner in which they entertain guests.

"Keep Cool."

SPEAKING of bulls, "Gnimmuc," in the Springfield, Ohio, *Daily Republic*, says:

"A case in point is called into remembrance which came under our notice. It occurred in Cincinnati during the Exposition, when the hotels were crowded with visitors, and one might consider himself fortunate if he got any kind of lodgings. One of the operators received a telegram for the Burnet House from a Sushee at a little town in Kentucky. The message read about as follows: 'I will be there on Saturday; keep cool.'"

"The operator thought at the time it read rather queer, but being used to receiving all kinds of curious things, he let it go without further inquiry. A few days afterwards a lady arrived at the hotel, and, after registering her name, inquired if her room was ready. The clerk answered that he was full. 'Why?' replied the lady, 'did you not get my telegram?' On referring to his file he found the message, and showing it to her said, 'You say *keep cool*, but don't say anything about reserving room; I did not understand it so, and there has been no apartment saved for you.' It then came out that the word 'cool' should have read 'room,'

which made some difference. You can well imagine there was one pretty mad woman just about that time, and the invectives she hurled on the unfortunate telegrapher were neither mild nor complimentary. The affair soon leaked out at the office, and the standing joke on Dick for several months was 'Keep cool, old boy.' While on matters telegraphic, I may mention a despatch sent by a gentleman to his lady friend, who was about to sail for Europe, 'Good bye all—Numbers, sixth chapter, twenty fourth verse.' Those having the curiosity to look it up will find the selection befitting. The announcement of a birth is made in rather dubious Latin, 'Hurrohri per taurine puer cuu vitrosus optimus, elegautum,' which we suppose means, three cheers for the bully boy with an elegant glass eye. We were going to relate the story of the regular Saturday night telegram sent to Springfield in years gone by, which ran in unvarying language each time, 'Love and a kiss; long letter to-morrow;' but we refrain, not wishing a storm about our ears, and remembering we should not tell tales out of school.

[From the *Scientific American*.]

Bunsen's Battery Improved.

To the Editor of the *Scientific American*.

WHILE Bunsen's battery is one of the most intense in use, considering its cost, there are two serious objections to its general adoption. The first is a want of continuous action, which renders it entirely unfit for many purposes; secondly, the offensive and deleterious vapor, which arises from it while in action, is an objection of scarcely less importance.

I have been laboring for some time to improve the constancy of this form of battery, while at the same time preserving its intensity; and this I have accomplished by filling the porous cup around the carbon with coarsely powdered (it should be powdered about as fine as gunpowder) graphite, which is a hard substance, obtained from the inside of gas retorts. The battery is set in action by moistening the powder with nitric acid, which is done by pouring a few spoonfuls into the porous cup. I have found that the current developed by this arrangement will be sustained for a long period of time, while its intensity is equal, if not superior, to that when acid alone is used. The poisonous vapor arising from the battery is very little, owing to the small quantity of acid employed.

There is, however, a circumstance attending the use of this battery, on which it will be well to make a remark. Sometimes, in making connection with the carbon, a screw is forced into it; and when this is the case, the screw becomes corroded and partially cuts off the current, and in some instances I have known it to cut the connection almost entirely off. If the points of the screws were plated with platinum or gold, the difficulty would be completely overcome.

Friendsville, Ill.

JAMES POOL.

Constructing Electro-Magnets.

A CORRESPONDENT of the *English Mechanic* describes a new form of electro-magnet constructed by him, which, he claims, is much superior in its effects to those of the ordinary construction. A number of pieces of iron wire, of No. 16 gauge and twelve inches in length, are each wound with fine insulated wire, commencing half an inch from one end and winding closely for 2½ inches towards the centre, and then going with two or three long turns to a point three inches from the opposite end, which is wound in the same manner as the first, leaving the ends of the wire long for subsequent attachment. The wire thus covered was dipped in spirit varnish and laid away to dry. A number of them were afterwards bent into the form of a horseshoe and surrounded in the bundle with a number of pieces of similar No. 16 iron wire, but not covered. The whole was then wound in the usual manner with eight layers of No. 16 insulated copper wire, to which all the ends of the inside wire were soldered. The magnetic effect is stated to have been surprising.

Weak Lightning.

THE hamlet of Wilkesbarre, in the Quaker-wealth of Pennsylvania is ahead on the slow lightning. Last week Dame Nature went in to rehearse in the elements. Great agitation prevailed, and among other big things perpetrated, was the exploit of a streak of lightning. The electrical bolt struck a railroad track at the mouth of a mine, followed the iron for one mile and a half under ground and nearly killed a man. The idea of the electric fluid taking passage on a railroad to facilitate its movements is new and comical. But that it should so tire out after a mile and a half of subterranean travel as to be unable to kill a man, when it had a fair chance to hit him, is at least refreshingly consoling, and could hardly have occurred in any but a comet year. The whole affair reminds one of the boy who placed some damp

powder upon a hot stove to dry it, and on its igniting ran into the yard to get a pail of water to extinguish it. "Why," said he, in explaining his loss, "before I got back with the water more than half the darned stuff had burned up."

Novel Application of Telegraph Wire.

Mr. L. SCHWENDLER showed, at the meeting of the Asiatic Society, a crow's nest made of pieces of telegraph wire, twisted together in a most ingenious and knowing manner. He said that lately such nests had been found frequently, and that it seemed as if the crows of India benefited by the introduction of Western civilization, and were by no means behind the age. As long as the crows built their wire nests on trees and buildings only, he as a telegraphic engineer would not object, but often they selected telegraph posts, between which and the telegraph wires they built those wire nests, causing what are known as "earth" and "contact," and interfering with communication. Crows, however, were by no means the only animals interfering by their domestic arrangements with overland telegraphy. Wasps built their mud nests in the porcelain insulators, causing, in rain and dew, leakage from the wire to the ground. Birds of prey frequently dropped dead fish and other offal upon the wires, causing contact. These were all frequent sources of temporary interference with telegraphic communication upon overland lines, and they, combined with many other facts, not necessary to mention, seemed to show that it would be a very great advantage to use subterranean telegraphs instead of overland lines.—*Calcutta Englishman.*

The Cuba Submarine Telegraph.

At an extraordinary general meeting of the Cuba Submarine Telegraph Company, held in London recently, the chairman, Mr. T. Hughes, said the vessel which had been sent out in December last to repair the break in the cable had accomplished that object. The cost of the repairs and hire of the vessel had been £20,500, in addition to which the company had lost about six months' traffic, which might be estimated at from £12,000 to £13,000. To prevent the risk of a similar loss of traffic in the future the directors had decided on the construction and laying of a duplicate cable. There was also the necessity for a second cable to accommodate the largely increasing traffic with the West Indies and South America. The length of the new cable would be about 400 miles, and a very favorable tender for the construction and laying of it had been received from Messrs. Hooper's Company, and in the event of that tender being accepted the cable would be laid in the autumn of the present year. To pay for the duplicate cable additional capital of £60,000 would be required, which was proposed to be raised by the issue of 6,000 shares of £10 each, bearing a cumulative preference dividend of 10 per cent., convertible into ordinary stock at the option of the holders. He concluded by moving a resolution to that effect, which was seconded, and, after considerable discussion, was adopted.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

Telegraphic Matters in Washington.—A Tornado and its Prostration of the Telegraphs.—Improvements in the Western Union Office, etc.

WASHINGTON, D. C., July 8.

TO THE EDITOR OF THE TELEGRAPHER.

THIS city seems to have dropped entirely out of the correspondence columns of THE TELEGRAPHER, but although we are now left by Congress, the President, and most of the Cabinet to ourselves, we are not entirely without the pale of national and telegraphic interest.

The retirement of Postmaster General Creswell from office was not unexpected to his friends and those having intimate business and social relations with him. It has been known for some time that he was weary and disgusted with the thankless labors of the position and would leave it with much more pleasure than he entered upon it. His failure to secure the telegraphs to the Post-office management has greatly annoyed him, and it had become evident that it was an impossibility to do so, certainly for a much longer time than remained to the present administration, and so he abandoned the task in disgust. His proposed successor, Mr. Hale, could not stand

the summer heats and smells of the capital, and so he fell out even before he had fallen in, and the country was deprived of the benefit which might have been derived from his administration of postal affairs. Ex-Governor Jewell, of Connecticut, now United States Minister to Russia, to whom has been tendered and accepted by cable the appointment of Postmaster General, is an ex-telegrapher, and served his time at the key as a practical operator, and when he was here as a Member of Congress, delighted to refer to his former telegraphic experience. He will reach here in about two months, when his views on postal telegraph and other matters of interest will, no doubt, be speedily ascertained by interviewers.

We celebrated the "glorious Fourth" here by getting up a tornado and storm, which for violence, fury and destructiveness, excelled anything within the recollection of the oft quoted "oldest inhabitant." Houses were unroofed, trees blown down, awnings, signs, etc., flying in all directions. This was followed by a deluge of rain, which completed the devastation and ruin; that will make July 4, 1874, memorable to inhabitants of Washington for many years to come.

The effect of the storm upon the telegraph lines was very disastrous. All the wires extending north from the city were prostrated and broken, poles blown down, etc., and all communication north completely suspended for several hours—a condition of affairs which has not occurred before for many years. Four large poles were blown down and broken off at the ground, and a great many minor breaks occurred in the heart of the city. At Beltsville, ten miles from Washington, on the Baltimore and Ohio Railroad, the wreck of a church was blown across the Western Union wires, completely demolishing them. Between Baltimore and Philadelphia the damage to the Western Union wires was also considerable. The lines of the Franklin Telegraph Company were also seriously damaged in the city and north of here. The Automatic Company came through with only a few trifling breaks in the city, but north of Baltimore its line suffered considerable damage. By noonday following, however, all of the companies working out of the city were working through, with half of the usual complement of wires on the Western Union and Franklin Companies' lines.

The Western Union Company are fitting up a new operating room in the main or old building occupied by the company on the corner of Pennsylvania avenue and Fourteenth street—an improvement which was much needed, and will add greatly to the comfort of the operating force, their present quarters being extremely uncomfortable in the summer on account of the heat. The fourth and fifth stories have been knocked into one room, with a lofty ceiling, excellent ventilation, and affording additional floor room. The view from this room is also extensive and pleasant, and all hands are very much pleased with the change.

The old operating room is to be used as a battery room, and the Callad substituted for the Grove battery. The entry clerks who now occupy the ground floor of the extension, will be removed to the room under the new operating room.

Business has, of course, fallen off considerably upon the adjournment of Congress, and the operating force has been correspondingly reduced. Among the changes in the Western Union office, Mr. J. Neisou has gone to St. Louis, and Messrs. Gove to Philadelphia, Boileau and De Grau to New York, and Brown and McArthur to the Virginia Springs. John Staleup has resumed work in the Western Union office here after a temporary sojourn in Florida. The genial Harry Bertram, late manager of the Washington office of the Automatic Company, is now employed on the Baltimore and Potomac R. R., where he holds a responsible and lucrative position.

An attempt is to be made to introduce here the American District Telegraph system, but its success is somewhat problematical. It has proved successful in Baltimore, and there is now no doubt will be permanently established in that city.

The Secretary of War has under consideration the subject of constructing the military telegraph line along the Texas border, an appropriation for which was made at the last session of Congress.

WASHINGTON.

Telegraphic Bulls and Personals.

SAN FRANCISCO, June 25.

TO THE EDITOR OF THE TELEGRAPHER.

HERE are some "bulls" that were perpetrated not long since by some of our ambitious young "plumes." I'll mention no names, as some of the parties are slightly on the muscle, and might make it disagreeable for me. I'm not afraid, only cautious. One of the parties was operating in an office where the messenger "boy" was a youth who would turn the scales at 200 easily. He had this boy running around town one hot day, looking for "John Bellar;" not being able to find such a man, he took the advice of an operator who had been there,

and gave the message to "John Bemar," who proved to be the owner. "J. N. E. Hacker" also caused some delay until it was suggested that "J. N. Thacker" would be an improvement, when the message was re-copied and soon reached its destination. To say the "boy" was hot would be drawing it mild indeed. Another quill copied "Niro" for "Niece," in some report, "M. J. Kilston for A. J. Ralston;" and "(sig.) H. T. Draft for Sight Draft," were also turned out by this enterprising youth.

Mr. Thomas R. Knox, late night operator, at "S" Sacramento office, sailed for New York last week. He proposes to devote his future to the study of law. Tom leaves many warm friends, both in Sacramento and this city, who wish him success in his new profession.

Tom Lee, the man who never breaks, takes the position vacated by Mr. Knox.

Mr. L. N. Jacobs, Manager A. & P. Tel. Co. in this city, has taken a run up among the snow clad peaks of the Sierras, where he will view the romantic scenery around "Tahoe" until his health improves. MAUDE.

The Morality of Using Tobacco.—A Defence of the Telegraphic Fraternity.

TO THE EDITOR OF THE TELEGRAPHER.

IN so confidently speaking of the alacrity with which young men would yield up their pipes and segars, should the ladies "learn to like" and desire them, Miss Elinor but reckons on their proverbial gallantry, and their established custom of giving up everything for the sake of peace. Even we, ourselves, though nobody's "brother, husband, or lover," should Elinor "learn to like a pipe," would take pleasure in presenting to a lady sensible enough to say, "I really like the smell of a good segar," as nice a little brown pipe as ever she put to her lips—our pet meerschau— the companion of many otherwise lonely hours, and from which we would part with a tear in our eye.

That all ladies do not dislike the fragrance of tobacco we were well aware, and have met some who have smoked segars, but we were just mean enough to deny Miss N. B. the pleasure of saying, with a sarcastic curl of her lip, "nice ladies, those;" therefore, allowed her "Jennie" and "Elias" their own way, on the principle of dealing gently with the erring—especially when of the weak and gentle sex.

Tobacco being "expensive" is a matter which concerns the smoker alone—its "uselessness" is to be settled hereafter, before a Judge who will not admit prejudicial witnesses; and of its being "disagreeable to others," we have only to say: If the fragrance of this tranquilizing herb is too overpowering to unaccustomed nostrils, such as thine, then don't smelt of this weed; "that's the kind of a fellow I am."

The death sentence pronounced on billiards by Misses "Nettie" and "Jeunie" comes with very poor grace from those whom Nature has peculiarly adapted to some of the intricacies of the game. The little smoking we have done has not "sunk us so far beneath the level of the brute," as "Elias" poetically says, but that we can remember how a woman's skill at "nursing" helped us along wonderfully in the game of life; and, since then, we have had numerous exemplifications of the readiness with which ladies can "make" or "avoid" a "kiss," as they please. To put one's arm around them is a game of 396 "points," judging from the wonderful manner in which they are fastened together with pins; and those poor fellows who are married can bear witness to their "jawing," and that they "scratch" awfully unless they are allowed to go for the "pocket."

Soberly speaking, those who claim telegraphers are immoral, "fast," and unsteady, basing that opinion on the small chauce beer and segars have when some operators are around, and the occasional game of billiards, are not only mistaken in their estimate of the fraternity, but biased in their standard of what constitutes a moral, upright, Christian gentleman—than which no profession can produce more favorable specimens than telegraphy.

The length to which this letter has run convinces us that "Elinor" was right in saying we were indolent. We began, and were too lazy to stop. TOM.

Origin of the Term "Plug."

UPON the authority of two telegraph superintendents we give their explanation of the origin of the term "Plug;" as applied to telegraphy. In 1851 there was a light haired youth of sixteen summers (not C. H.), who struck dots and dashes at West Greenville, Pa. The office call was "G," and the youth signed "Pl." By constant use it verged into the word "Plug," and has continued in use ever since. Doc. Plummer, now superintendent at Oregon, is familiar with the facts in the case. If any one has a more reliable theory than the one we have given, it would, no doubt, be acceptable to all telegraphers.—*Plug.*

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JULY 11, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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Telegraphic Journalism.—Its Failures and Successes.

THE suspension of another of the publications started within the last few months to furnish the telegraphic fraternity with a journal which it was supposed would prove more popular than others whose object it is to instruct as well as amuse, noticed in another column, suggests the idea that those who regard THE TELEGRAPHER as too elevated in its tone and character to meet the views and capacity of telegraphers, have been somewhat mistaken. There seemed to be for a time an epidemic of such publications as that referred to but we have never anticipated that they could become permanent. *The Switch* was, in many respects, the best of its class, and if either of those recently started could succeed, its prospects might be considered excellent, and, in fact, it has proved the longest lived of either of them so far.

For nearly eleven years THE TELEGRAPHER has pursued the even tenor of its way, and its prospects were never better or more promising than they are at present. The truth is, it meets a necessity, and while the field for it is a good one, it so fully occupies it that there is not much room for another telegraphic publication depending upon its patronage for support. We believe that, all things considered, it more nearly meets the views and supplies the requirements of the fraternity than any similar publication in this country has ever done, and that this is the reason why it is permanently successful. It is true that even THE TELEGRAPHER is not so generously supported, so far as subscriptions are concerned, as it should be, and there is much room for improvement in this respect; but it is more generally read and appreciated by the fraternity than any telegraphic publication has ever been before in this country.

While it is designed to devote a portion of its space to articles intended to exhibit the more amusing phases of telegraphic personalities and service, this is by no means its main purpose. Even the lighter sketches which it contains usually contain elements of instruction, warning and improvement, which are not lost upon its readers. Its scientific and practical articles are prepared by able and practical writers, electricians and telegraphers, and are carefully edited, and convey an amount of useful information and instruction which

cannot be obtained in any other publication, and which are worth, to any telegrapher who desires to become proficient, and excel in his profession, much more than the price of subscription many times over. The information which it contains from week to week keeps its readers thoroughly informed of the progress which is being made in telegraphy throughout the world, and a volume of the paper gives a complete telegraphic history for the year. Especial attention is given to this department of the paper, and, we think, very little that is worthy of record escapes notice in its columns. The "correspondence," which has always been a leading feature, is also of much interest and importance. It is true that some communications appear which do not possess any very great merit, or display very thorough acquaintance with the matters of which they treat; but the idea is, and has been, to afford the fraternity, and all who are interested in telegraphic and electric matters, a chance to be heard, and communications which are properly written, and do not contain libelous personalities, are never rejected.

We have referred to these matters again, not so much to set forth the merits of THE TELEGRAPHER as to indicate why it survives and flourishes, while other telegraphic publications, after an ephemeral existence, disappear and are soon forgotten. All of those to which we refer, with perhaps one exception, possess good and interesting features, but their scope is not sufficient to enable them to become permanent. We have welcomed them all as they have appeared, and they have had our best wishes for their prosperity, and we have never regarded them as in any sense competitors of this paper. An experience in newspaper management, extending over several years, has shown that it requires special and peculiar qualifications, conditions and purposes, to secure support not only for telegraphic but for journals of any character or description. As we have before remarked, newspapers and journals *grow*; they do not usually spring into immediate, profitable existence. It would probably surprise many of our readers to learn of the amount of money which was expended in publishing THE TELEGRAPHER before it became self-supporting. As a matter of fact, it was never so until within the last four or five years, and had it not been originally published by, and at the expense of the National Telegraphic Union, it would not at the present time, probably, be in existence.

We do not say these things for the purpose of discouraging anybody who thinks he is called upon to attempt telegraphic journalism from engaging in it. Before doing so, however, such a one will do well to carefully consider and investigate the subject, and ascertain not only the expense necessary to be incurred but the patronage likely to be secured.

Journalism, at the best, and especially telegraphic journalism, is a laborious, frequently vexatious and troublesome pursuit, and no editor or publisher can reasonably expect to please all of those who read his publication. Almost every individual has his or her ideas of how a journal should be conducted, and there are probably but a small minority who are not confident that they could improve on the best and most conscientious efforts of the person to whom the task of editing and managing any given newspaper is committed. We have had but little reason to complain of criticism in this respect, and, perhaps, have received more commendation than the paper is fairly entitled to, but still there has been enough of the former to prevent us from becoming too much puffed up, or overconfident in our ability and acquirements. However, we strive to do the best that we can, and we think that our efforts to present to the fraternity here and elsewhere a creditable sheet, have not been wholly unsuccessful. We know that THE TELEGRAPHER is by no means perfect, but we are confident that each volume that appears is an improvement on those which have preceded it, and shall continue our endeavors to improve it from time to time, and to labor to advance the best interests of the telegraphic fraternity and its status, and have no doubt but that we shall receive an adequate support.

The Cincinnati Industrial Exposition of 1874.

THE Board of Commissioners of the Cincinnati Industrial Exposition have issued a pamphlet containing their rules and premium list for the year 1874. The cover of this publication is gotten up in refulgent chromatic glory, while the interior is handsomely printed on cream tinted paper with a red line border, as a gentle intimation that things are going to be done up in style. The exposition opens this year on Wednesday, September 2d, and continues until the evening of Saturday, October 3d.

This exposition has always been noted in years past for its great display of electrical and telegraphic apparatus, which has been got together under the stimulus of a very liberal premium list. The list this year is much the same as last, and, for the benefit of any of our readers who may wish to compete, we print a copy of the list, which is as follows:

DEPARTMENT K.—CLASS 60.

No. 571	Best system of Fire Alarm Telegraph (in operation).....	Gold Medal.
" 572	Best Adaptation of The Telegraph to domestic use.....	Silver Medal.
" 573	Best Telegraphic Railway Signals	"
" 574	Best Fire Alarm Signal Box....	"
" 575	Best Telegraph Instrument for Stock Quotations.....	"
" 576	Best Set of Instruments for Electrical Measurement.....	"
" 577	Best Battery for force, durability and economy.....	"
" 578	Best Electric Light.....	"
" 579	Best Ship Telegraph, electric or pneumatic.....	"
" 580	Best Electric Hotel Annunciator	"
" 581	Best Combination of Morse Instruments.....	Bronze Medal.
" 582	Best Box Relay with Key.....	"
" 583	Best Pocket Relay.....	"
" 584	Best Morse Register.....	"
" 585	Best Single Cut-out.....	"
" 586	Best Switch for 4 to 20 wires...	"
" 587	Best Sounder.....	"
" 588	Best Key.....	"
" 589	Best Electro-Magnetic Motor...	"
" 590	Best Electric Watchman's Clock	"
" 591	Best Dial Instrument.....	"
" 592	Best Lightning Rod.....	"

We regret to see that the commissioners have repeated the mistake of previous years—that of putting the electrical and telegraphic apparatus in the same class with optical and philosophical instruments, and which in practice makes it very difficult, if not impossible, to procure judges competent to give thoroughly intelligent awards in both these departments. With this exception, however, there is little room for criticism. The awards in this class have, however, given very general satisfaction in previous years, as far as the electrical apparatus, at least, is concerned, and this will undoubtedly be the case this year. The coming exhibition bids fair to exceed in extent and interest any of its predecessors, and it is hoped that the inventors, manufacturers and dealers in electrical apparatus, will be well represented this year, as has been the case heretofore.

Suspension of "The Switch."

THE SWITCH, a Chicago journal, devoted to local telegraphics, has suspended publication. It may possibly be attempted to revive it at a future day, but this is looked upon as very uncertain. As this was regarded as the best of the new school of telegraphic newspapers, its discontinuance will doubtless be regretted by many who regarded its semi-monthly appearance with interest. So far as we know, this leaves in existence only *The Plug*, published at Cincinnati, and a rather feeble but more pretentious sheet, as regards dimensions, in this city.

Journalism is at the best an uncertain venture; and especially is this the case with class journals, which must derive their support from those engaged in one business or pursuit. Newspapers *grow*, seldom springing into immediate and profitable existence, and require to insure permanence and success, capital, enterprise, energy, and, at least, some journalistic experience.

During the more than ten years that THE TELEGRAPHER has been published, several attempts have been made to establish telegraphic journals in this country, none of which, dependent upon the patronage received for continuance, have been successful. Meantime it has pursued the even tenor of its way steadily, increasing its circulation, and favored with all the advertising patronage desired, and at times even unable to afford the space for all the latter which is pressed upon it.

Another Atlantic Cable Completed.

THE new cable to be laid by the Anglo-American Telegraph Company has been completed by the Telegraph Construction and Maintenance Company of London, and will be taken on board the steamship Great Eastern, which is expected to sail on the 27th inst., to lay the cable between the coast of Ireland and Newfoundland.

The policy of the Anglo-American is, and has been, to provide facilities in advance even of the requirement for them, which in telegraphy is certainly a very wise policy. We understand that notwithstanding the general business depression the business of the Anglo-American is better than it has been at any time heretofore, and exhibits a steady and gratifying increase.

A Chance for Inventors.

WE would direct the attention of the scientific portion of our readers to the advertisement of the United States Electro-Motor Company, which will be found in another column. This company offers a bonus for the production of a galvanic battery suitable for the purposes of the company, which ought to be sufficient in amount to stimulate some of our inventive geniuses to produce the required article. Though the conditions are somewhat difficult, yet we know of no insuperable difficulty in the way of their fulfillment, and have little doubt that a successful candidate for the prize will make his appearance in due time. The gentlemen composing the company are well known in telegraphic and business circles in this city, and there is no doubt of their ample responsibility and disposition to fulfil their promises, as set forth in the advertisement.

Lightning and Lightning Arresters.

ONE of the greatest perils for telegraph instruments and batteries, at this season of the year, arises from an excess of atmospheric electricity, with which the wires are constantly liable to become charged, and frequently without the slightest notice or warning. How much damage is done in this way every year it would be somewhat difficult to estimate, even approximately. River cables and other short cable lines are thus frequently rendered useless, and the work of discovering and repairing the damages is both slow, troublesome and expensive.

This peril may be effectually guarded against by the use of properly constructed lightning arresters, and one of the best of these to be had is the *Globe Lightning Arrester*, manufactured and sold by F. L. POPE & Co., of this city. By the use of these arresters damage from atmospheric electricity may be certainly avoided, and the peculiarity of their construction and arrangement avoids the danger of the line circuit becoming grounded through them from any cause.

Personals.

MR. G. FRANK STEWART, late of the 198 Broadway, New York, office, of the Atlantic and Pacific Telegraph Company, has accepted a position with the same company at Buffalo, N. Y.

MR. WILLIAM S. LEWIS has resigned his position on the night force of the Western Union Company, at 145 Broadway, New York, and has gone home to Lexington, Illinois, to look after other interests. So pleasant a companion, and so good an operator, cannot be otherwise than missed by operators and management. The many friends he leaves behind would be pleased to see him back again.

MR. H. L. GRAMZON, until within a year past one of the "old men" at No. 145 Broadway, New York, has resigned his position with the Atlantic and Pacific Company, at Syracuse, N. Y., and returns to the Western Union office, 145 Broadway, New York, as the successor of Mr. WM. S. LEWIS.

MR. M. G. CHIPMAN, late of the Atlantic and Pacific office, at 198 Broadway, New York, has been transferred to the Syracuse, N. Y., office of the same company.

MR. H. W. CLARKE, recently night report operator for the Western Union Company at Wilkesbarre, Pa., has accepted a position with the same company at 145 Broadway, New York.

MR. A. H. BABB, and recently of the Atlantic Pacific office at 198 Broadway, N. Y., has accepted a position with the Western Union Company at Albany, N. Y.

MR. B. C. KEELER, an undergraduate at the Michigan University, Ann Arbor, Mich., has temporarily accepted a position with the Western Union Company at No. 145 Broadway, N. Y., with the intention of rejoining class betimes.

MR. W. E. BISHOP has accepted a position with the Western Union Company at No. 145 Broadway, New York.

MISS G. W. HARKNESS, only sister of Mr. W. E. SMITH, Manager of the Western Union Telegraph office at Oakland, California, died in London, England, on the 5th ult.

The Springfield, Ill., *Journal* says that Mr. O. A. STEPHENSON, formerly a telegraph operator at Jacksonville, has been appointed General Superintendent of the Chicago and Paducah Railroad.

MR. JACK WOLLARD has resigned his position as night operator at Blue Cañon, for the Central Pacific Railroad, on account of ill health.

MR. J. K. L. CURRIER has been appointed night operator for the C. P. R. at Blue Cañon, *vice* WOLLARD, resigned.

MR. G. R. CRAWFORD has resigned his position as agent and operator for the C. P. R. at Blue Cañon, and gone West, Mr. G. W. HILL, from Summit, filling the vacancy.

MR. ADOLPHUS McMERRICK has been appointed agent and operator for the C. P. R. at Summit, Cal.

MR. SORELLE PEARSON, late Receiver Western Union Telegraph Company at Chicago, Ill., has been appointed Cashier on Central Division, Atlantic and Pacific Telegraph lines, at Chicago.

MR. F. SCOTT SMITH has resigned his position in the Albany, N. Y., Western Union office on account of ill health, and returned to his home in Cooperstown, N. Y., where he will, for the present, have charge of the office in the Cooper House.

MR. FANCHER, formerly of Lansingburgh, N. Y., office, takes the position in the Albany, N. Y., Western Union office resigned by Mr. F. SCOTT SMITH.

MR. A. BABB, late of St. Louis, Mo., and A. and P. office at No. 198 Broadway, New York, is temporarily employed in the Albany, N. Y., Western Union office.

The Telegraph.

By Cable.

THE NEW ANGLO-AMERICAN CABLE COMPLETED.

LONDON, July 4.—The new telegraph cable of the Anglo-American Company was completed to-day. The Great Eastern is to leave, to lay the cable between Ireland and Newfoundland, on the 27th of this month.

The Missing Cable Steamer Faraday.

IN the last issue of THE TELEGRAPHER was printed a report from Halifax, N. S., of the total wreck of the cable steamer Faraday, from collision with an iceberg. This report was telegraphed from Pictou, on Wednesday of last week, by Mr. Chipman, who, in a letter to the *Press* (newspaper) of Halifax, says he obtained the information from Mr. William Earle, of the cable staff at Port Hastings, who stated that he had received it from St. Pierre.

A subsequent report contradicted the rumor, and stated, under date of Halifax, July 3d, that communication had been had with the Faraday, and that after leaving Halifax she experienced continuous fogs near Torbay, and was greatly delayed, but that it was hoped she would reach Portsmouth, N. H., in a few days.

This report also lacks confirmation up to the time this is written, but it is expected that she will soon make her appearance. A vessel which arrived at Halifax on Monday last reports having passed a large steamer at anchor, which was supposed to be the Faraday, but had no communication with her.

Messrs. Siemens Brothers ordered by cable despatch, on Thursday of last week, the steamer Ambassador to

leave Portsmouth in search of the Faraday, and to report at Halifax. The Ambassador arrived at Halifax, but did not see the Faraday.

A cable despatch from Messrs. Siemens Brothers to Mr. Harrison, on the same day, directed him to go in search of the Faraday. He arrived by special train at Halifax on the same night and hired a tug, and left Halifax at four o'clock on Friday morning.

A press despatch from Halifax, N. S., of Wednesday last, states that the North German brig Rover reports: Saw the cable steamer Faraday, on June 27th, ninety miles southeast of Halifax, engaged in picking up cable.

Up to the time this is written no certain or definite tidings have been received from the Faraday, and there is considerable anxiety about her.

The Protection of Government Telegraph Lines.

THE Secretary of War, in a general order, has published, for the information of the army, the act passed at the last session of Congress to protect lines of telegraph constructed or used by the United States from malicious injury and obstruction, which makes it a misdemeanor to injure or destroy any of the works, or property, or material of any telegraph line constructed or in process of construction by the United States, to be punished by a fine of not less than \$100 nor more than \$1,000, or with imprisonment not exceeding three years, or both.

Telegraphic and Electrical Brevities.

THE Western Union Telegraph Company has opened an office at Southampton, Long Island, with Miss M. Vanderburgh as operator, Miss Vanderburgh was formerly of the "Fa" Hartford, Conn., office, where she achieved a pleasant fame. Southampton may be regarded as trebly blessed, in that the genuine Atlantic breaks upon its shores in a subdued murmur, bringing health and appetite with it; that it has been put in telegraphic communication with New York and the rest of the world, and that its telegraphic facilities are administered by so able and amiable a young lady.

The Western Union Telegraph Company having paid to the Union Trust Company the sum of \$30,000 in currency, being the annual payment to the sinking fund, the Trust Company will receive proposals, on or before the 1st August, for the sale of the bonds of the Western Union Telegraph Company to the extent of \$59,000 in currency, being the total amount of funds now in hand applicable to this purpose. The Trust Company reserves the right to decline all proposals for the sale of the said bonds at a greater premium than 10 per cent. above par in currency.

At the annual meeting of the Maine Telegraph Company in Bangor, Me., June 24, the following directors were elected: William Galloupe, Albert Holton, Albert W. Paine, Jacob A. Smith, Bangor, Me.; Hiram O. Alden, William H. Simpson, Belfast, Me.; Bien Bradbury, Wm. P. Merrill, Portland, Me.; Edward F. Littlefield, Winterport, Me. The board subsequently chose H. O. Alden, President and Wm. P. Merrill, Secretary and Treasurer.

The lines of the Maine Telegraph Company are leased to and worked by the Western Union Telegraph Company.

The Atlantic and Pacific Telegraph Company have opened an office in the Grand Union Hotel at Saratoga, N. Y.

Foreign Telegraphic Notes.

THE Brazilian cable has been opened to the public for the transmission of messages to Madeira, with stations at Funchal and Ponto do Pargo, and to St. Vincent.

The number of messages passed over the Cuba Telegraph line during the month of April was 1,475, estimated to produce £1,800; and for the month of May, 1,823 messages, estimated at £2,200.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JULY.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
2	73% 74½	.....	.....
3	74% 75	.....	.....
6	74½ 74¾	.....	.....
7	73% 74%	.....	.....
8	73% 74½	16 16	.....

TO ELECTRICIANS AND INVENTORS.

OFFICE OF THE UNION ELECTRO-MOTOR CO., }
62 BROADWAY, NEW YORK, July 8, 1874. }

The attention of Electricians and Inventors is invited to the following proposition: The

UNION ELECTRO-MOTOR COMPANY

Desire to procure a

GALVANIC BATTERY

Fulfilling the following requirements:

1. It must be capable of maintaining a steady current of 6 farads per second through a resistance, external to the battery, of two tenths of an ohm, with not more than six pairs of plates. This is, approximately, equal to the current developed by 3 of Chester's No. 2 carbon cells, charged with mixed nitric and sulphuric acid in the porous cells through 50 feet of No. 18 copper wire .049 inches diameter.

2. It must be absolutely free from fumes, and from liability to leak or spill its contents under any ordinary circumstances. If possible, it is desirable that a battery should be provided to work without liquids—in other words, a dry battery.

3. It must be capable of standing for a considerable length of time unused without material depreciation, and yet be ready to give out its full power at a moment's notice whenever required.

4. It must be self-supplying to an extent which will render it capable of furnishing a current, as above stated, for not less than 300 hours in succession without renewal.

5. Other things being equal, preference will be given to the battery occupying the smallest space.

For the best battery fulfilling the requirements herein specified a premium of

FIVE HUNDRED DOLLARS

will be paid, in accordance with the decision of the judges, if the battery is adopted by the company—which shall also have the privilege of exclusive ownership by paying the additional sum of

FIFTEEN HUNDRED DOLLARS.

This offer will remain open until November 1, 1874.

Judges.—MARSHALL LEFFERTS, President of the Gold and Stock Telegraph Company; GEORGE B. PRESCOTT, Electrician of the Western Union Telegraph Company, and FRANK L. POPE, Electrician.

E. B. GRANT, President.

H. H. DUNCKLEE, Secretary.

THE "SNAPPER" SOUNDER.



TRADE MARK. PATENTED MAY 12, 1874.

POLISHED, 30c., OR 6 FOR \$1.50.

POLISHED, WITH NICKEL-PLATED SPRING, 40c., OR 6 FOR \$1.80.

POLISHED, WITH KNOB AND SCREW FASTENINGS, 75c.

PRICE,  75 CENTS.

Sent post paid on receipt of price.

R. W. POPE, Box 5278, N. Y.

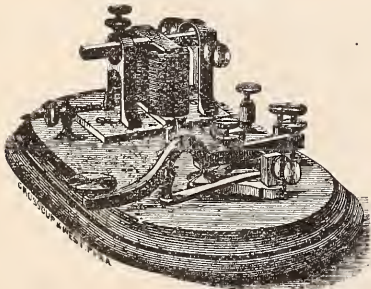
SMITH & HALL,

HAMILTON, ONT., Agents for the Dominion.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,

WAVERLY HEIGHTS, PENNSYLVANIA.

PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

If money be sent in advance by registered letter. 12 00

Instruments without Battery. 11 50

Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

SEND FOR CIRCULAR.

[From the New York Evening Post.]

TO WHOM IT MAY CONCERN.

Mr. DANIEL H. CRAIG'S acts of bankruptcy dissolved my business relations with him, which I have declined to renew.

GEO LITTLE, C. E.,

July 1, 1874.

Passaic City, New Jersey, U. S. A.

A MATEUR TELEGRAPH INSTRUMENTS.

Owing to the number of orders and the delays of manufacture I have been unable to meet the demands of the public, but am now ready to furnish my customers, and the public generally, with Nos. 1, 2 and 3, well finished and at very moderate prices.

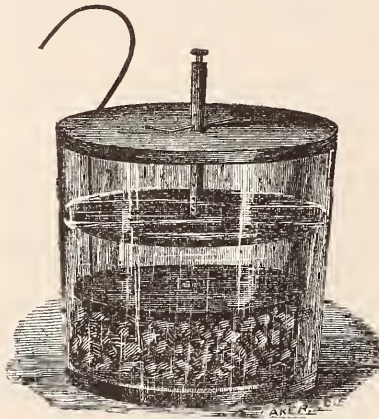
G. A. WESSMANN,

544 NOSTRAND AVE.,

Brooklyn, N. Y.

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

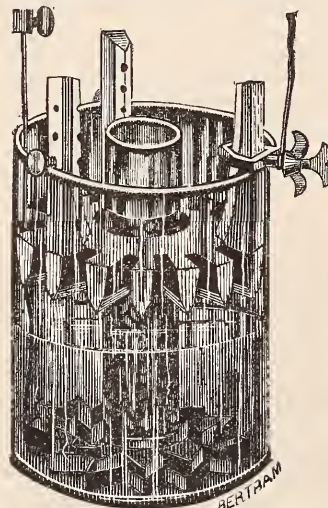
This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

41 THIRD AVENUE,

Chicago, Ill.

THE BALTIMORE BATTERY.



Acknowledged to be Superior to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

ANNOUNCEMENT!

MESSRS. PARTRICK, BUNNELL & CO.

hereby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

— AT —
22 DEY STREET,
NEW YORK,

where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL

AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in

CHAMPION LEARNERS' INSTRUMENTS,

NEW GIANT SOUNDERS, PERFECTED,

IMPROVED CURVED KEYS,

ELECTRIC BELLS, IN GREAT VARIETY,

NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED

LIGHTNING ARRESTERS,

LATEST AND BEST FORMS OF GRAVITY BATTERIES.

Together with LINE WIRE,

OFFICE WIRE, BRACKETS,

INSULATORS, LINE TOOLS, Etc.

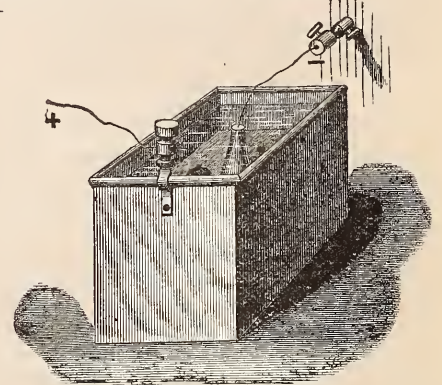
Send for Catalogue and Price List.

PARTRICK, BUNNELL & CO.,

22 DEY STREET, NEW YORK.

38 South Fourth Street, Philadelphia.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for the manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

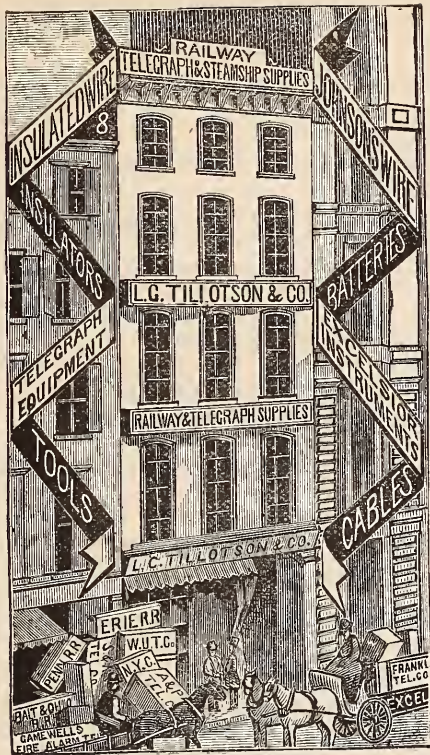
No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5508.)

38 VESEY STREET, N. Y.



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE.

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

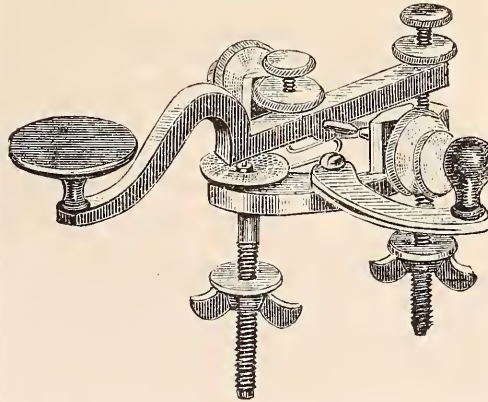
SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"**BEST**" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARM,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

**THE BEST TELEGRAPH MATERIAL
IN THE WORLD
AT THE LOWEST PRICES!**

The prices on our Catalogue are very low, but we are offering 20 per cent. discount from them on all Telegraph Instruments of our manufacture.

L. G. TILLOTSON & CO.,
8 DEY ST., N. Y.

**CHEAP TELEGRAPHY BY THE AUTO-
MATIC TELEGRAPH CO.**

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
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Each additional word 1c		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

NEW YORK OFFICES:

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MANUFACTURERS OF

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CHAMPION LEARNERS' APPARATUS,

with Complete Instructions, Battery, Wire, etc.,

GIANT' SOUNDERS,

Improved Curved Keys,

Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

GEO. H. BLISS & CO.,
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CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
- IMPROVED COMBINATION INSTRUMENTS for main line.
- RELAY, SOUNDER and KEY on same base, making an elegant set.
- WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
- HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
- WESTERN UNION (new style) SWITCH BOARDS.
- ELECTRIC BELLS, single or vibrating stroke.
- MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR

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- PUTT'S MECHANICAL INSTRUMENTS.
- UNITED STATES ELECTRIC GAS LIGHTING APPARATUS.
- POPE'S RAILWAY SIGNALS,
- SELDEN'S PRINTER,
- ANDER'S MAGNETIC DIAL and PRINTER
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AGENTS FOR

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- MOORE & SONS' and PHILLIPS' MAGNETIC and OFFICE WIRES.

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AGENTS FOR

- BROOKS' INSULATORS,
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- TELEGRAPH POLES,
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- STUBBS and PATENT PLIERS.

VAUGHAN'S AUGERS and TOOLS in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID; the finest in the Market.

TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.

SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.

Bliss' Manual and Price List furnished free on application.

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AERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

- J. W. STOVER,
General Agent and Superintendent.
- L. B. FIRMAN, Chicago, Ill.,
General Agent for the West and North-West.
- J. R. DOWELL, Richmond, Va.,
Special Agent for Virginia and North Carolina.
- J. A. BRENNER, Augusta, Ga.,
Special Agent for Georgia and South Carolina.
- L. M. MONROE, New Canaan, Conn.,
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ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE.

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which referencels
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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| Alleghany, Pa., | New Orleans, La., |
| Boston, Mass., | New Bedford, Mass., |
| Bridgeport, Conn., | New Haven, Conn., |
| Buffalo, N. Y., | Newark, N. J., |
| Baltimore, Md., | Omaha, Neb., |
| Chicago, Ill., | Philadelphia, Pa., |
| Cincinnati, Ohio, | Pittsburg, Pa., |
| Columbus, Ohio, | Portland, Maine, |
| Cambridge, Mass., | Peoria, Ill., |
| Charlestown, Mass., | Providence, R. I., |
| Covington, Ky., | Quebec, L. C., |
| Detroit, Mich., | Rochester, N. Y., |
| Dayton, Ohio, | Richmond, Va., |
| Elizabeth, N. J., | St. Louis, Mo., |
| Fall River, Mass., | St. John, N. B., |
| Fitchburg, Mass., | Springfield, Mass., |
| Hartford, Conn., | San Francisco, Cal., |
| Indianapolis, Ind., | Savannah, Ga., |
| Jersey City, N. J., | Syracuse, N. Y., |
| Louisville, Ky., | Troy, N. Y., |
| Lowell, Mass., | Taunton, Mass., |
| Lawrence, Mass., | Toledo, Ohio, |
| Lynn, Mass., | Toronto, Canada, |
| Mobile, Ala., | Washington, D. C., |
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System
OF
FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM
AND
POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original **FARMER & CHANNING PATENTS**, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

QUICK SALES, SMALL PROFITS AND SUPERIOR GOODS.

We are offering any of our unequalled Telegraph Instruments at 20 per cent. discount from list prices.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

CHARLES T. CHESTER,
104 Centre Street,
NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

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A REVISE AND ENLARGEMENT OF THE
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VOL. V—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

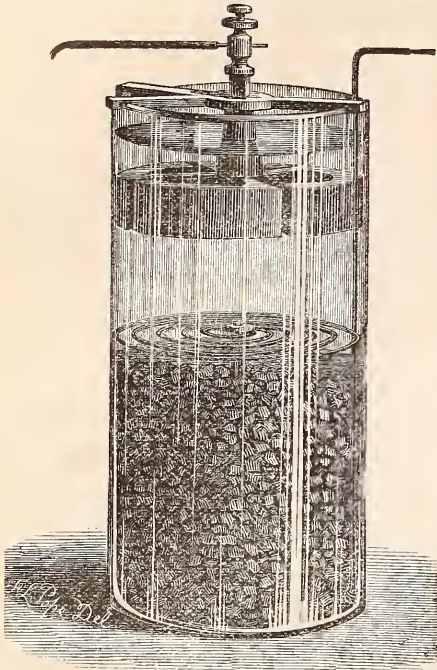
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

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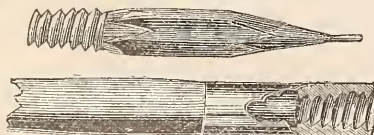
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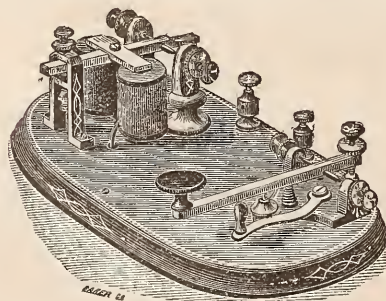
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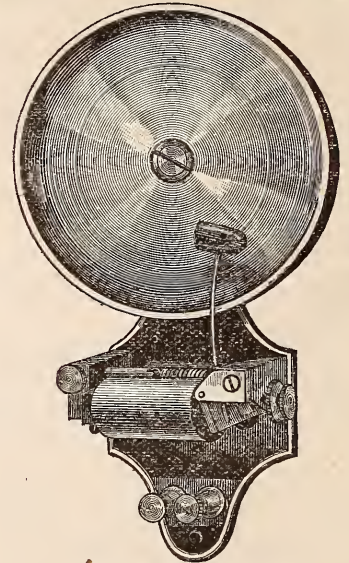
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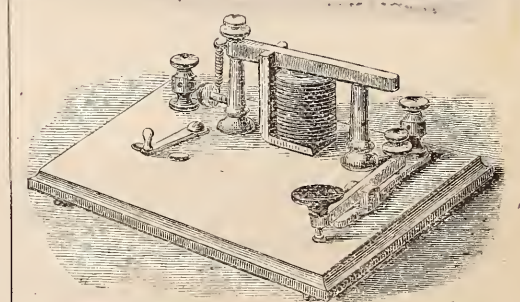
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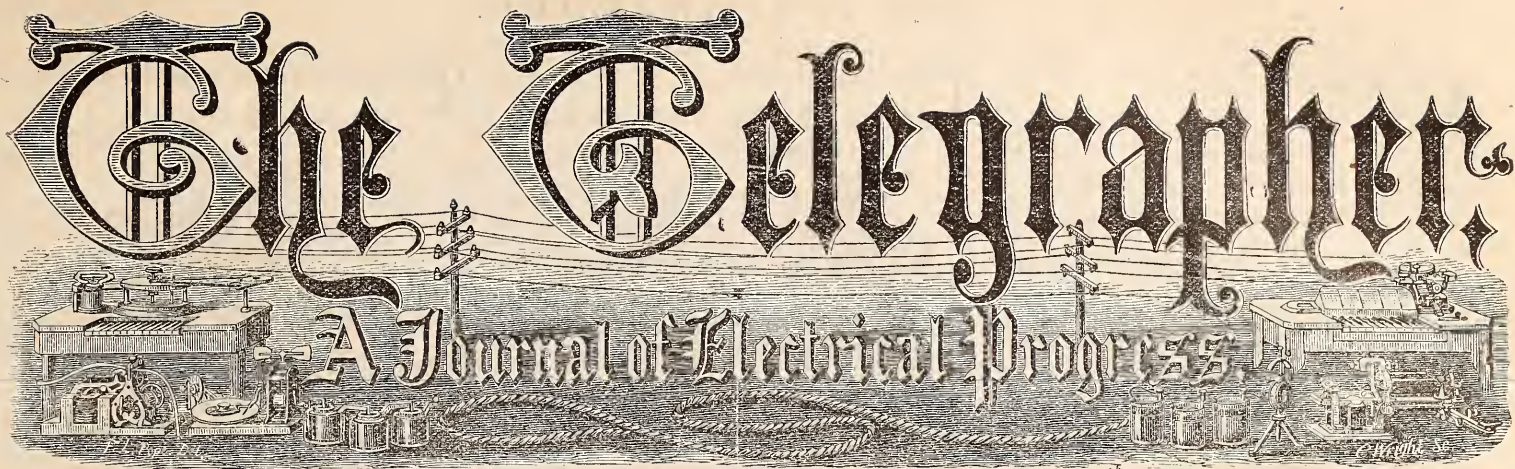
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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, July 18, 1874. Whole No. 418

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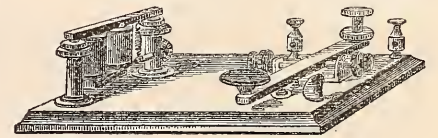
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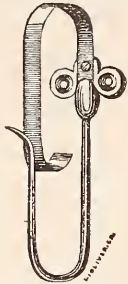
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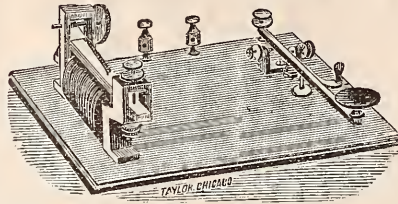
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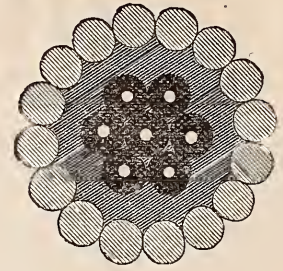
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THE TELEGRAPHER

A JOURNAL OF ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JULY 18, 1874.

VOL. X. WHOLE No. 418.

Original Articles.

"The Dutch have Taken Holland!"

THE New York Times of Friday, July 10th, devoted a column to a description of what it terms "New Inventions in the Science of Electrical Transmission," the inspiration of which was evidently derived from Western Union sources.

Wednesday afternoon last, at the Broadway office of the Western Union Telegraph Company, a test was made of an invention which promises to be of almost more importance to the present age than were Morse's first achievements to the people of his own time. The test resulted successfully, and it proved that four messages can be simultaneously sent on a single wire in opposite directions, and with no more liability to mistake than as if an equal number of wires were used.

We are surprised to learn from the above article that, notwithstanding the fact that the duplex apparatus, in one form or another, had been experimented with by Gintl, Siemens, Frischen, Edlund, Precece, Farmer, Stearns and others, from 1849 to the present day, and has been in every day service on one or more wires of the Franklin Company since 1868, it never was actually invented until the Western Union Company adopted it, "so recently as three years ago."

But the new arrangement beats all! "In one instant it will quadruple the usefulness of the 175,000 (?) miles of wire used by the Western Union Company." "It is a new process of multiple transmission, by which two messages can be sent simultaneously in the same direction over the same wire, and either message can be dropped at any way station."

in page 160 of Sabine's Electric Telegraph, does the same thing in a perfectly feasible and effective manner.

Stark employs two keys at the sending station and two relays at each receiving station. Either key can be worked separately, or both simultaneously, without interference, and copies of either or both communications can be dropped at any way station. The arrangement is perfectly practicable in every respect. The principle is much the same as that of the duplex, making use of differing strengths of current upon the same line wire.

Theoretically there is scarcely any limit to the number of communications that can be simultaneously kept up over one wire. The practical limit is found in the number of different intensities of current to which the relays can be adjusted. For example, suppose we arrange five keys at a sending station, and connect them so that the first key would send a current of five cells of battery, the second of ten cells, the third fifteen, the fourth twenty, and the fifth twenty-five—and we also arrange five relays at the receiving station on five different adjustments, so that the first key would operate one relay, the second two relays, and so on.

Those who are curious to see the manner in which this problem of quadruple transmission has been worked out, will find a description of Bosscha's method in Dr. Schellen's Elektromagnetische Telegraph.

Instead of this so-called "discovery" being the "solution of all difficulties in the future of telegraphic science," it would be more likely to open up an entirely new set of difficulties.

One thing is certain, if the Western Union Company are going to "speedily put in practice this new system," one of the first things they will find it essential to do will be to pull down their old glass insulators and get their lines into a condition of at least decent insulation in rainy weather. If they will do this it is quite possible that the quadruplex may yet become a practicable system on the limited number of circuits where such a device is needed; but, in the words of Mr. Orton (edition of 1869), "If there is any practical value in the apparatus, its use—like that of the Morse telegraph—is freely open to all."

As if this were not enough, we are next treated by the Times man to a dissertation upon musical telegraphy, apropos of a recent invention of Mr. Elisha Gray, of Chicago, which has lately excited much attention in telegraphic circles. Mr. Gray is well known as an inventor of much ingenuity and originality, and has a deservedly high reputation for his achievements in the line of electro-mechanism.

they can be readily compared with portions of our own article:

[From the N. Y. Times, July 10, 1874.] [From THE TELEGRAPHER, May 22, 1869.]

About two months ago Mr. Elisha Gray, of Chicago, a gentleman well known in the electric telegraph world as a maker and inventor of some of the most valuable instruments now in use, conceived an idea which would be an extraordinary development of telegraphic science, if he could only succeed in practically demonstrating it.

One of the most remarkable recent inventions connected with telegraphy is the telephonic one, an instrument which transmits directly the pitch of a sound by means of a telegraph wire—either an air wire or submarine cable. This instrument is a German invention, and was first exhibited in New York, at the Polytechnic Association of the American Institute, by Dr. Van der Weyde.

Short as has been the lapse of time since he first began his experiments, he has succeeded, almost beyond his own anticipations, in perfecting an instrument which will convey sound by electricity over an unbroken current of extraordinary length.

It is clear, from the foregoing explanations, that no quality of tone can be transmitted—much less can articulate words be sent—notwithstanding the enthusiastic prediction of some persons, who, when they first beheld this apparatus in operation, exclaimed that now we would talk directly through the wire. It is from its nature able to transmit only pitch and rhythm, consequently melody, and nothing more.

Mr. Chandler says that he regards it as the first step toward doing away with manipulating instruments altogether, and that he believes that in time the operators will transmit the sound of their own voice over the wires, and talk with one another instead of telegraphing. The writer has seen this novel instrument at work, and has heard music played on a small melodeon, or piano key-board, transmitted through an unbroken circuit of 2,400 miles, and reproduced on a violin attached to the receiving end of the wire.

The point coming in contact with this small vibrating disk is connected with the ground wire, the other pole of the battery with the air wire or submarine cable. It is clear, from this explanation, that at every contact of the platinum point a wave of electricity will be sent over the wire, and as many waves in a second as there are contacts; and as there are many contacts as there are vibrations in every second, the number of electric waves will always be exactly equal to the number of vibrations corresponding with the pitch of each tone; he it fifty, one hundred, two hundred, or five hundred in every second.

The apparatus, by means of which this extraordinary feat in telegraphy is accomplished, has been named by Mr. Gray the telephonic, or an instrument designed for the purpose of transmitting sound to a distance. To this transmitting instrument the conducting wire is attached, the other end being attached to the receiving apparatus, which may be anything that is sonorous, so long as it is electrically connected with the strip of metal stretched between the strings at a point where the bridge of the instrument is ordinarily placed, will, on receiving the sound transmitted through the conducting wire from the piano, give out a tone very similar in quality to that of an ordinary violin.

The instrument in which this succession of waves is made audible at the other end of the telegraph wire is founded on the fact first investigated by Professor Henry, of the Smithsonian Institute, at Washington, that iron bars, when becoming magnetic by means of electric currents passing around them, become slightly elongated, and at the interruption of the current are at once restored to their original length. It consists of an elongated wooden box, of which the top is made of thin pine wood, similar to the sounding board of a stringed musical instrument, to which the iron bars are attached two bridges, carrying long pieces of moderately thick and very soft iron wire, which, for nearly their whole length, are surrounded by a coil similar to the coil of the electro-magnets used in telegraphing. One end of this coil is attached to the telegraph wire, the other to the ground wire, as represented in the figure. At every instant that a contact is established at the station where the sound is produced, and a current wave thus transmitted, these wires will become magnetic, and consequently elongated, and they will be shortened again at every interruption of the current; upon the character of the receiving apparatus, which may be a violin prepared as described above, a tin hoop, with foil paper heads stretched over it, after the fashion of a baby's rattle, a nickel five cent piece, an old oyster can, and a thin

sand other things. A sound, sufficiently loud to read Morse telegraphic characters, made by interrupting, with the common telegraphic key, one sustained note has been obtained, under favorable circumstances, at the receiving end of the wire without any more scientific sounding apparatus than that of a piece of common tissue paper.

Aside from the intense interest which this discovery will naturally excite in the scientific world—as to the causes which produce this extraordinary electro-physiological phenomenon, and the gratification it will afford to all lovers of the marvelous—it is evident that, although the practical uses to which it may be put cannot as yet be recited, quite enough has been demonstrated to show that, from its basis, a new system of telegraphy, both for aerial and submarine lines, of a simple, rapid and economical character, can be introduced. Mr. Gray has applied for patents of his invention in this country and in all the countries of Europe.

The above extracts "would go to prove" that some of our "noted electricians" not only "know little at present of the future of electric science," but that a good deal of the past in that science has also failed to attract their attention.

We wonder, also, if the somewhat over-enthusiastic Mr. Chandler ever heard of the old joke that used to be current in telegraphic circles, that the direct talking plan was once tried between New York and Philadelphia, but had to be given up on account of the Philadelphia operator's breath smelling too strongly of bad whiskey!

Seriously, we would be the last to detract in the smallest degree from the praise and honor due to the worthy inventor, equally worthy whether he puts into practical or useful form some grand original discovery of his own, or whether he only improves, perfects and renders available the previous inventions of others. But in the latter case it is the grossest injustice to give praise without stint to the latest comer, while the previous laborers in the same field are passed over utterly without recognition; and when this is done, as in the present instance—whether intentionally or otherwise, matters not—it is but an act of simple justice, for one who knows the facts, to use what means may lie in his power to set the matter right.

Bill Body's Recollections.

(No. 2.)

BY JOR HIBBARD.

It was one of the balmy, breezy Sunday afternoons during our stay at the Hayforks, while we were stretched at full length in the shade of the one solitary cherry tree of which the whole county boasted, our thoughts soaring far above the robins and blackbirds which were devouring the ripe and luscious fruit on the overhanging branches—soaring far into ethereal space—and while we were prospectively soaring far into the future, and thinking of heaven and the angels, and wondering if we, as an angel, would be restricted in our comforts and enjoyments—wondering if we would not be permitted *once* in a while to enjoy our Havana, if we would only carry a spittoon under our arm (wing is meant), or if, perchance, our Yankee ingenuity should ere we stepped forth from this footstool, devise and patent a smoke, ashes and saliva consumer with which we might enjoy ourself undisturbed and undisturbing. It was during moments of this kind, while we were thinking all about these matters, that Bill Body broke in upon our tranquil reflections and began—

"I wish you could ha' seen jest the one whitest man that ever stepped into *this* ranch," pointing over his shoulder with his thumb at the telegraph office. "He was missed powerfully when he left here; he's missed yet. No one will ever satisfactorily supplant *him*." (Complimentary already.)

"He was the best customer old Fillet ever had, I reckon. I *spose* he's *owin'* him yet, but he allus sed he'd r'ather never pay a man than cheat him out of an honest debt. 'n I reckon this debt is an honest one. He had the quarest name, though. I ever see—so kind o' odd and peculiar. He took *his* drops to the call of Johnny Smith."

"Hem! Seems as though I have *heard* of Johnny," remarked I.

"Have ye? Well, now, he *ain't* no slouch, is he? kind o' quar and peculiar, though, jest like his name. Ust to call me Boddv, as ef I *warn't* anybody unless it was called to me. Powerful humiliation to me, that. Now *you* knows my name is *Body*—B-o. B-o. d-y dy, Body, perounced jest the same as Podunk—that is, the last of it is."

"Ah! Podunkdy *isn't* slow," we inwardly mused—"particularly for the place."

"I cal'l'ate Johnny never laid by any great amount of cash—leastwise not fur any great while. Half a day and one night was all he wanted to get rid of his filthy lucre. He used to say he preferred filthy liquor to filthy lucre—fur, if liquor did lead to evil, lucre did the same thing; fur didn't the bible say it was the root? He never sent any money to his old mother—that's Mrs. Smith, you know—'cause he didn't want her to learn extravagance, 'n get worldly notions into her head, and hate to die, maybe, fur he cal'l'ated she was pretty well prepared now, 'n 'twould be a pity to have so much wasted after all her trouble. No, he never sent her a red, although she was a widder, and blind, and palsied, and considerable deaf, and, in fact, had already been dead several years. You know she *wasn't* dead, only he jest told the parson that one day when he was reprovin' him fur hein' so neglectful to her. And then the parson cried with him, 'n sed he hoped he'd live good and meet his mother in Heaven; and Johnny sed he hoped so too, and blubbered some; 'n then, after the parson was out of sight, around the corner, he saluted him with his finger tips in close proximity to his nose, 'n then pulled out a bottle and sed, 'Come, boys, les give him a bumper.' Great contrast atween him 'n the next one—Dutiful Harkins, we ust to call *him*. He warn't called Dutiful afore he kim here, I don't reckon, but *we* give him that name. He was a lean, lank, lubberly goshin', but the best hearted and hest natured feller in the world, 'n jest as lazy as he was good natured. Green! wal, I reckon you'd swear he was an infantile cucumber, only he was *big-ger*, of course. Ust to send all *his* money home, after he'd paid his bills, 'cept a small 'lowance, in case of necessity. The boys ust to play all sorts o' tricks on him. One night, when he laid on the table asleep, and it come up an awful thunder shower, they took a piece of copper wire about four foot long and fastened it to the top wires of the switch and tied it to one leg, and then tied the ground wire to the other, sayin' they was goin' to see bow he'd work as a lightnin' arrester, 'n then they went outside, to wait fur developments. They didn't wait long, fur jest then there kim an awful crash—must ha' struck close by, somewhere—and—well, it *waked* Dutiful up, no kind o' doubt about that, 'n it roused him clean off'n that table 'n into the fur corner of the room so quick the boys stood there wonderin' what had become of him. They thought maybe it had singed him up like as if he'd been a hair, and they war powerful scart for a minit. But bymeby he commenced to grunt, 'n then they found him back behind the door—that is, they found *something*, and they supposed it was Dutiful, 'cause it bad some scraps of copper wire mixed up along with it; but it was the wust lookin' Dutiful I ever see. They fetched him too after a while, though, so's he went to work in a fort-night, and then they treated him better for a spell; but bymeby the thing wore away, and they begun to put their heads together to hatch up sutbin' else. Finally, one o' 'em got one o' the boys down the road to make up a bogus message, and sign it Ablam E. Goodsell, and Dutiful hunted all over the surrounding country in the rain to deliver it. You see that was before the trick was known round about like it is now, and Dutiful didn't see what a *blame good sell* it was till after he was cuched; but he did *then*, for he got the rheumatix, and had to quit.

"And then they sent Jeddly Robbins here. Jeddly had a girl down the road, 'n he ust to go down every Saturday night, and he was gittin' awful spoony, when, one day, some vagabond down at Cromwell sent him a message, sayin' she would be on number two that afternoon (two didn't stop here then), and signed her name to it. Wal, what d'ye 'spose he did, but just jump on a freight train 'n go up to Greening's, where two jest slacked, 'n bought a ticket, 'n got on. Of course he didn't find her, but he was in fur it, fur the train didn't stop agin till it got to Elmwood, thirty miles from here, and he couldn't git back till next afternoon, 'ceptin' he walked, and I don't cal'l'ate he'd do much a walkin'. That, of course, give him *his* ticket of leave.

"Larky James had jest kim out here, lookin' fur a job, 'n so he stepped right in behind Jeddly. Larky was appearin'ly from the interior somewhere, and unsophisticated, 'cause he'd never seen country life, you see. He had a curious way of tellin' everything in the dearest kind of earnest, so that ef one *knew* he warn't tellin' the truth you'd find yourself believe him. Larky went fishin' over in Stoddard's pond one day, and didn't catch nothin'; found out afterwards he tied the bait onto the line above the hook, expectin' it would operate same's a steel trap set for a polecat, and, of course, he hated to come home empty handed; so he found a grocery over there, and hought a codfish and four or five mackerel, 'n reckoned he'd astonish the natives when he got back. But we knew more about them waters than he did, so we asked him if they warn't *salt* fish. He sed of course they war. Wal, ses I, them waters ain't no ocean, only jest a little lake, or pond, so to speak. I thought I had him there, fur he hesitated, and I 'sposed he was losin' his grip, but

presently his face lit up a trifle, and he spoke out confidently and firmly: 'Who sed it was an ocean? I didn't *think* of such a thing; its likely there's a *salt mine* there somewhere!' I sed, 'that's so; I didn't think o' that.' But he got hifalutin', and we couldn't stand him nohow, so we sent him on a wild goose chase out to Martinsburg, where we told him there was a job waitin' that would pay him a hundred dollars a month. And *then* we got a character here—"

And so I suppose Bill Body would have gone on, if my landlady had not announced tea ready at that moment—gone on till now, maybe, and my obituary would have occupied this space instead of yours, next week, after you had read this.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 63, 64 AND 65, UP TO AND INCLUDING JULY 11TH, 1874.

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MISCELLANEOUS.

63.—95, 121, 211, 553, 764, 952, 1995, 2026, 2119, 2168, 2178.

64.—95, 211, 414, 916, 952, 1995, 2178, 2201.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice that hereafter an acknowledgment of the receipt of an assessment should be taken as a receipt for all previous assessments.

"John Oakum."

THE Attleboro' (Mass.) *Chronicle* prints the following. It would now seem that for once, at least, a prophet is not without honor in his own country:

"When the former editor of this paper retired from its conduct, he left many friends who still follow him with kindly interest. We have been among those who have wished him well, and enjoyed an intimate personal acquaintance with him. Since leaving here Mr. Phillips has been engaged in the telegraphic art at 145 Broadway, N. Y., devoting his spare time to writing for the New York *Graphic*, *Hearth and Home*, and the leading telegraphic journal of the country, THE TELEGRAPHER. Among telegraphers he stands at the head as a writer of their peculiar style. Everybody on the wire knows him. We publish this week an article of his from *Hearth and Home*, a journal which professes to accept nothing which is not first class, and which has among its corps of contributors such as Edward Eggleston, whom some regard as the leading American Author. Our readers will recognize the signature of "John Oakum," appended to 'Sand,' on the first page, as one with which they are already familiar. We have reprinted several articles from the *Graphic* and other papers in previous issues. To our mind they evince

ability of more than ordinary excellence, and show a facility in the use of English that promises distinction for the future. The originality of his style commends it especially. Our New York correspondence, we have no doubt, our readers find highly acceptable, though of course it differs entirely from the nature of such articles as those of 'Sand.' Will our predecessor and our present correspondent accept our heartiest congratulations for his success."

The Last Message.

"DR. GOSSE gave full medical instructions up to near the end, and when he (Mr. Stapleton, the station master at Barrow's Creek) appeared to be getting worse, Mrs. Stapleton, who resides in North Adelaide, was sent for by Mr. Todd. She conversed with her fast sinking husband by wire, and while messages were still being sent from here asking for further information, a telegram came announcing his decease."—[The *South Australian Register's* report of the affray with the blacks of Barrow's Creek.]

In reference to the foregoing "Geoffrey Crabthorn," a regular contributor to the *Register*, has the following verses:

There's a threadlike creek in a stony bed,
With dull brown tufts of a stunted shrub;
An open plain, where the grass is dead,
And sombre forest and tangled scrub.
There's a long low range, stretching far away,
And rudely fashioned of rough hewn stone,
In the mellowing light of the fading day
Stand the high white walls of a station lone.

In darkened room of the building drear
There's a deep red stain where the life stream ran,
The poisoned point of a broken spear,
And the pain pinched face of a dying man.
There's a faithful friend, who has faintly heard
A whispered wish from the trembling mouth;
There's a throbbing needle that sends the word
Twelve hundred miles to the peaceful south.

There's a woman who sits in a lofty hall,
And waits with a wan and bloodless face—
While terrible moments seem to crawl—
For a word, one word from the far off place.
There's a message that comes on its path of fire—
The whispered wish of the station lone—
And an answer that flies on the mystic wire
From the woman that sits with the face of stone.

Husband and wife—but how far apart!
With never a clasp of the dear one's hand;
Yet mighty science, how great thou art—
They speak o'er forest, and scrub, and land,
And the pain pinched features no longer wince,
And a tear of joy from the dim eye slips
At the fond, last words that a moment since
Came fresh and warm from the wife's sweet lips.

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Quadruple Transmission by the Morse Telegraph System.

TO THE EDITOR OF THE TELEGRAPHER.

PERMIT me to say a few words through the columns of THE TELEGRAPHER in reference to an article on 'Telegraphy in the *New York Times* of the 10th inst., on a supposed new discovery made by Mr. George B. Prescott, the Electrician of the Western Union Telegraph Company, the development of which is ascribed to the enterprising policy of Mr. Wm. Orton, the President and Executive Manager of that company, who is represented as saying that the "new discovery" may be called the solution of all difficulties in the future of telegraphy. This "new discovery," by the way, as is well known to all electricians, and must have been known to Mr. Prescott, is a very old one, dating back to 1846, and since much experimented with as a curious philosophical problem by two Germans, at least, published and described in the *Polytechnisches Blatt*, of Vienna, in 1854 and 1855—also referred to in the English works of that eminent electrician, Mr. Sabine, and others, in 1869.

Now, admitting (which I am willing to do for the sake of argument) that the statements referred to are correct, let us see what would be the gain to the company in the number of words transmitted per minute. Mr. Prescott says "the usual rate upon Morse lines does not exceed seventeen words per minute" (I quote Mr. Prescott's own book, *The History, Theory and Practice of the Electric Telegraph*, p. 149); then add about one half for duplex transmission, say nine words per minute (which in practice is all the gain), making a total of twenty-six words per minute, then add fifty per cent. by, we will say the German method of quadruple transmission (which in daily practice would be quite useless), the gain would in theory and on a com-

paratively short line be equal to twenty-five and a half words per minute, which, divided up into four messages, leaves the same subject to all the old Morse difficulties, such as liability to interpretation by feel, taste, or by sound, by any Morse operator, and may be so appropriated; and, in addition, there would be the inevitable complication of the Morse apparatus, adapted to quadruple transmission, in combination with some sixteen or more conflicting compensations, in order to meet, among other difficulties, that of climatic changes.

Being somewhat conversant with the subject, I will conclude by asserting that more work could be accomplished in the same time, on the same length of circuit, by the comparatively slow automatic process of Wheatstone. As to what is being daily actually accomplished by my American Automatic Telegraph system, "*Magna est veritas et prevalebit.*"

GEORGE LITTLE,
Passaic City, New Jersey, U. S. A.

July 11, 1874.

The Comparative Actual Speed of the Automatic and Morse Telegraph Systems.—What the Public Really Want.

NEW YORK, July 11th.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE in THE TELEGRAPHER, under the head of "Original Articles," Mr. George Little undertakes to show that, by the automatic system of telegraphy, an equal number of words can be transmitted on one wire in the same space of time as would require, under the Morse system, sixteen distinct wires and thirty-two Morse operators.

Mr. Little's system does not, as he claims, transmit thirty-six thousand words an hour, but it does characters, which, after having been received, must be translated. On this point Mr. L. is silent. I am inclined to the opinion that the number of translators and time necessary to put the thirty-six thousand words into copy, so that it may be read by any one, will be equal to the amount of time expended by sixteen wires and thirty-two Morse operators. In other words, I, as a patron of the Western Union, cannot economize time by transferring my patronage to the Automatic Company, and I do not think even Mr. L. will claim I can. Cooching this, the next and only things which can influence the support of the public are rates.

I am in no way interested in the Morse system, but, on the contrary, have always hoped and believed that a system will be developed which will be, as compared to the present, what rapid transit (when completed) will be to the horse railroad. I will admit, however, that (and it is a formidable weapon in the hands of the opposition) the same amount of territory could be controlled under the automatic system (provided that system is not over estimated) as the Western Union lines do, at one fourth, if not less, than the present capital of that company, from the fact that you require so few wires. This is economy in construction. As to economy in force for office work (as I said in the beginning), I incline to the opinion that the number of translators one of the automatic wires would require, and their salaries, would equal in number and amount that required by sixteen wires under the Morse system.

Now, if the automatic can perform all it claims (and I hope and trust it may), there can be no great difficulty in carrying out the project intimated by a morning daily a few days ago, as being under consideration by the various railroad companies not controlled by the Vanderbilt party (who, as you are aware, are the back bone of the Western Union), and supported by Colonel Tom Scott, Mr. Watson and the B. and Ohio R. R., if the article in question has any truth in it.

With the opposition lines now in operation and lines owned by the railroad corporations consolidated, I think capitalists might be induced to invest, provided the railroads subscribe liberally—then with the automatic system a formidable opposition could be organized which would reduce the rates, which, after all, is what the public want; they must be the party benefited after all; to them the present rate of speed is as satisfactory as the rate of speed by which they are compelled to part with their money is unsatisfactory.

FRANKLIN MORSE ROGERS,
4 Exchange Court.

A "Bull" and an Atrocious Pun.

CALIFORNIA, July 2.

TO THE EDITOR OF THE TELEGRAPHER.

ON a sunny day in June, 187—, as the fledgling of Morse, at Summit Valley, was seated in his elegant office trying to while away his time by practising sending forty words a minute with his key closed, and just as he seemed most likely to succeed, for some mysterious cause (to the outsider) he suddenly ceased writing and listened attentively for a second, then leaning

forward and opening his key he rattled away, I I Dv. The following message was then traced in the highest style of art:

"Blue Canon.

Bally Jones.

Send Book Ox Team in parlor to Sacramento.
7 paid. J. A. JOHNSON."

Without noticing that the check was wrong, according to the way he had received it, he hurriedly signed his letter M, carefully folded the message, and, enclosing it in an envelope, started for the hotel. After delivering the message to Bally he returned and sat down with the air of one who had sustained his reputation as a first class man, telegraphically speaking.

He had been seated probably fifteen minutes, when, happening to glance towards the door, he observed an excited individual approaching, who proved to be the party to whom the message was addressed. If the aspiring knight of the key had any doubt as to the cause of the individual's excitement, all doubt was dispelled when Bally let the following words drop out of his mouth like a red hot shot out of a cannon, "What in the h—l does Book Ox Team in parlor mean?" Taking the message and scrutinizing it carefully our hero observed the check was not correct, according to the way the message read—there being eight words in it, and upon asking B C to repeat it he found it should read, "Send Book-Oxley in parlor to Sacramento," instead of "Ox Team." After explaining it satisfactorily to Bally he returned to his instrument to commune with nature alone, but was roused from his reverie by some fellow (who had been listening) manipulating very slowly and carefully, so that there could be no mistaking its meaning, "Hadn't you better go with that ox team to explain where the 'bull' comes in?" It is almost needless to state that he sent no reply, but then he wasn't mad, oh, no!

A. P. LUG.

Origin of Popular Terms.—When does an Operator Cease to be a Plug?

PORTSMOUTH, O., July 10.

TO THE EDITOR OF THE TELEGRAPHER.

I LIKE the idea of some of your correspondents of digging up the origin of terms, and, with your permission, will propound a question or two.

The term "O. K." is becoming very general, in our country at least, especially in the telegraphic business—no message being sent, I believe, without its use.

I believe it was first used by some eccentric individual whose duty it was to endorse certain papers "All Correct" over his signature, and he wrote it thus, "Oh Koreect." If this be correct, who was this individual, and on what occasion was it used?

Again. It seems very general for telegraph operators to term all "plugs" who are less skilled in the "electric art" than themselves. The question is, how much of a telegrapher must one be when he ceases to be a "plug?" More anon. D.

Mr. Bean's Duplex Telegraph System.

STEVENSON, ALA., July 10.

TO THE EDITOR OF THE TELEGRAPHER.

IN response to Mr. Bean's invitation for criticism on his system of duplex telegraphy, as illustrated in THE TELEGRAPHER of July 4th, I would like to ask him what is to prevent the current from both batteries, M B' and I B' going to line when key K' is closed?

G. W. HOWE.

Telegraphic Bulls.

A PENNSYLVANIA correspondent sends the following specimens of telegraphic bulls, which have lately come under his notice on the line upon which he is employed:

"John Smith, _____
House burued five o'clock this morning."
TOM JONES."

This was received by an amateur as follows:

"Folks better five o'clock this morning."

Another writes as follows:

"To _____, Condr., No. 50.
Overslept ourselves. Will be out on No. 7.

JOHN BROWN."

To show that the amateurs don't make all the bulls, it should be said that this was received by an "old timer."

"Over in Sept. Ourselves will be out on No. 7."

A COUNTRY paper says that, in reply to a question from the lecture committee of the chief town of the district, as to the subject of a lecture to be given at the institution, the lecturer telegraphed, "A Taste of Naples and Rome." The operator made it read, "A Taste of Apples and Rum."

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JULY 18, 1874.

THE TELEGRAPHER:

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"More Startling Inventions for Rapid Telegraphing."

ABOUT five years ago a thick pamphlet was published by the Western Union Telegraph Company in opposition to the proposed union of the telegraphic and postal systems, which was widely circulated among members of Congress and others interested. The author of this document, in a paragraph under the title which heads this article, took occasion to disparage and ridicule the automatic and duplex telegraphs, the latter of which had even then been more than a year in successful and continuous operation upon the lines of a competing company, and had been referred to by the advocates of the postal telegraph as an improvement of considerable value. The conclusions which the Western Union pamphleteer arrived at may be briefly summed up as follows:

1. The duplex is a very old invention.
2. It is of no practical value whatever.
3. If it was of any practical value its use is free to everybody, including the Western Union Telegraph Company.

These conclusions appear to have afforded great satisfaction to the faithful at that time, for we find them substantially repeated in President ORTON'S report to the stockholders the same year, in which he remarks, in reference to the duplex, that it "has long occupied a prominent place among speculative telegraphers, and has recently been extensively advertised by the promoters of various competing lines." The sequel of all this is well known to our readers. Within less than three years the Western Union Company purchased the duplex patents at a good round price, when, presto! that much abused invention underwent an instantaneous transformation. It suddenly became one of the most wonderful, extraordinary and valuable discoveries that had ever been conferred upon the human race, if we may judge from the reiterated assertions not only of the official organ but of President ORTON'S report for 1873.

But all this is as dust in the balance compared with more and greater wonders that still lay behind, only awaiting a fitting occasion to be unveiled to the open mouthed amazement and admiration of a somewhat credulous world! Not until last week did such an occasion present itself. On Thursday, however, some

of the New York dailies gave currency to a rumor to the effect that an alliance had been formed between the Pennsylvania, Erie, and Baltimore and Ohio railroads, and the Automatic Telegraph Company, which would enable the latter concern to extend their lines to the principal Western cities, whereupon, by means of their improved machinery for telegraphing, which, in rapidity of transmission throws the duplex entirely in the shade, they would unquestionably be able to knock the future dividends of the Western Union—in the expressive idiom of the vulgar small boy—"higher than Gilderoy's kite!"

Our Western Union friends, however, were by no means caught napping. With a wise forethought, which cannot be too highly applauded, they had previously chartered a Bohemian, and, after taking him round to the grand radiating electrical dispensary in the rear of 145 Broadway, had literally crammed him to the muzzle with scientific lore. On Friday—the very next day after the appearance of the above article—they pointed him directly at Wall street, and fired him off in the columns of the *New York Times* with a most terrific detonation, to the great temporary demoralization of the enemy! As soon as the smoke cleared away a little a reporter of THE TELEGRAPHER was dispatched to the scene, whereupon it was discovered—this was a "discovery," mind, and not an "invention"—that the greater part of the noise was in reality nothing more than Chinese thunder, and that little or no actual damage had been done.

The truth is, things have changed within five years. The Western Union Company's shares have been placed on the list of the Stock Exchange; in other words, it has become a speculative concern, and like the puny rivals which its officers were accustomed to refer to in such contemptuous terms, it has at length itself taken to the extensive advertising of "startling inventions for rapid telegraphing." An article in another part of this paper would rather seem to point to the conclusion that the alleged wonderful inventions and discoveries of the *Times'* article bear a strong resemblance to Falstaff's lurch—"a pennyworth of bread to a most intolerable deal of sack." The scientific articles which appear in the New York dailies are sufficiently amusing as a rule, under any circumstances, but in comparison with the productions of the inspired penny-a-liner of the *Times*, most of them are but as the feeble glimmer of the splintering tallow dip to the retulgent glory of the noon-day sun.

Telegraphic Rumors and Fancies.

IN the absence of sensation topics, the comet and the TILTON-BEECHER scandal being worn nearly threadbare, and the business at the Stock Exchange being exceedingly dull, some of the New York dailies have gone extensively into the manufacture and publication of reports and statements in regard to new telegraphic combinations and so-called inventions, which are expected at an early day to revolutionize the telegraph business.

The financial editor of the *Evening Post* led off with a startling statement of what was proposed to be done by the Automatic Telegraph Company, in connection with the leading railroad companies, as follows:

"For some time past it has been known that an effort was making to establish a new telegraph company, and it is now reported that the negotiations to this end have been nearly completed. We have been unable to obtain full particulars in regard to the scheme, but hear that three of the railroad companies running the principal trunk roads from the Atlantic seaboard to the West (exclusive of the New York Central) propose to build telegraph lines over their roads, and such roads as they control, for a new telegraph company, which will take these lines on a 999 year lease. The railroad companies, in consideration of having free use of the telegraph lines, are to keep them in repair. The instrument used is to be that of the Automatic Company, and it is claimed that the new company will be able to reduce the cost of conveying messages by telegraph from one quarter to one half present rates. Mr. Peter H. Watson, of the Erie Railway, has been mentioned as President of the new company, and it is said that this is the secret for his recent refusal to accept

another election as President of the Erie. We have been unable to learn whether there is any connection between this project and the new Atlantic cable which the Faraday is now laying."

The design of this statement, which is a repetition, more in detail, of similar reports which have been promulgated at intervals of from three to six months during the past year and a half, was evidently to "bear" Western Union stock, and that it had the intended effect was evident in a decline of two or three per cent. in the quotations. We have investigated the matter, and are assured by leading officials of the Automatic Telegraph Company that no such arrangement has been made or is likely to be made at present, and doubtless Mr. WATSON was as much surprised as anybody to learn of his intended transfer from railroad to telegraph management.

Our Western Union friends, to counteract this device of those who were short of the stock, on Friday of last week had printed in the columns of the *Daily Times* a statement in regard to a wonderful invention which immediately quadrupled the facilities of that company, and rendered unnecessary the expenditure of any more money for line construction. We have elsewhere exposed the absurdity of this so-called invention and the assertions in regard to its value and importance. The Street evidently was not in the mood for "bulling" Western Union, and its effect was not perceptible in the quotations.

The New York *Tribune*, not to be outdone in the good work, supplemented these reports with the following:

"One of the Erie directors, prominent in the organization of the new telegraphic combination, said, yesterday, that for twelve months past efforts have been made to unite the organizations competing with the Western Union. The project had not been successfully carried out in respect to the union of all the companies, but the extension of the lines of the Atlantic Company would very probably hasten the negotiations now pending.

The principal obstacle to the union of all the outside lines is the attitude of the Atlantic and Pacific Telegraph Company. This organization has grown very steadily, and the officers laugh at the idea that they are likely to enter into any combination. They state that their success has long since been assured, and that they will enter into no combination like the one proposed."

On Tuesday last the *Tribune* devoted nearly a column to the automatic and quadruplex systems, the invention of both of which it attributes to a person who has as much claim to one as the other, and none to either; the gist of which is that while the automatic is a big thing it is of small account, and cannot compete with the marvellous quadruplex. This opinion, however, it does not set forth as that of the writer, but of our friend, Mr. GEO. B. PRESSCOTT, electrician of the Western Union Telegraph Company.

We think this vein is nearly worked out now, and shall hope to have a rest for a few weeks, and until the new Atlantic cables are laid, when another excellent opportunity will be afforded for the display of enterprise on the part of our newspaper manufacturers.

We are informed that there is this much truth in the reports in reference to the Automatic Company: The managers of that company are endeavoring to complete arrangements for extending the lines, and expect, before long, to construct a line between New York and Boston. Only this and nothing more.

The Telegrapher in Texas.

MR. D. W. H. VOORHIES, of the Western Union Telegraph office at Houston, Texas, has kindly consented to act for THE TELEGRAPHER in that section, and to look after its interests. We hope that the friends of THE TELEGRAPHER will cooperate with Mr. VOORHIES, and that we shall soon receive a large addition to our list of subscribers in Texas, and elsewhere in that section of the country.

We shall also be pleased to receive information relative to telegraphic matters in the south and southwest, and communications from the fraternity in that section on matters which interest them more especially.

Safety of the Cable Steamship Faraday.

THE cable steamship Faraday arrived at Portsmouth, N. H., on Thursday of last week all right, and thus relieved the serious apprehensions for her safety which had been caused by her long detention in consequence of fogs. The shore end of the cable having been successfully laid, she will proceed to complete the task, which, unless she again becomes befogged, she has yet time to do before the season in which it is practicable to lay cables across the Atlantic ocean has passed. It is to be sincerely hoped that there may be no further delay, as such delays entail serious loss on the contractors, and it will cause a general disappointment if there should be a failure to get the line in operation during the present season. It is important that the experiment of an independent cable should be tried, and if it proves successful, practically and pecuniarily, undoubtedly other cables will be laid at no distant day. If otherwise, it will be very difficult to obtain the large amount of capital requisite for another such enterprise.

Resignation and Appointment of a Supt. N. Y. Fire Alarm Telegraph.

MR. C. KINNEY SMITH, who has for some years past been in charge of the Fire Alarm Telegraph of this city, recently resigned that position, and Mr. JOHN H. EMERICH, of the regular night force of the Western Union Telegraph office at 145 Broadway, has been appointed Superintendent in his place, and has entered upon the discharge of his duties.

Under Mr. SMITH'S administration the efficiency of the department has been greatly increased, and he has exhibited much practical and executive ability in the arduous position which he has held with so much credit to himself and advantage to the city.

Mr. EMERICH, the new Superintendent, has been connected with the department in a subordinate capacity for several years, and thoroughly understands the duties and requirements of his new position. The appointment has, of course, necessitated his retirement from the night force at 145 Broadway.

Mr. EMERICH is one of the old stock of telegraphers, and has been identified with the telegraphic service for many years. He was in the War Department at Washington during the late war, and was one of the original staff in the cable room up to the time of the "strike," when, like many others, he sacrificed a promising business future for the sake of maintaining a principle. He is excellently qualified for his new and responsible position, and the Fire Department is to be congratulated on having secured so competent an officer.

Personals.

THE Western Union Telegraph Company has opened an office at the Maritime Exchange and News Room, 66 Beaver street and 113 Pearl street, New York, of which Mr. R. M. MATTOCKS has been appointed manager.

Mr. J. L. KERR has been transferred from the office of the Montreal Telegraph Company at Toronto, Canada, to the Buffalo, N. Y., office of the same company.

Mr. J. A. ROBLIN has been appointed train despatcher and chief operator Sacramento, Cal., Div. C. P. R. R.

Mr. C. R. SNEARER has been transferred from Reno, Nev., to Sacramento, Cal., office C. P. R. R.

Mr. ED. NORRIS has been transferred from night to day force in the Sacramento, Cal., office C. P. R. R.

Mr. E. SOMMERVILLE has been transferred from the Sacramento, Cal., W. U. office to San Francisco, Cal., office same company.

Lieut. JOHN EGAR, a rising "uth," of strong military proclivities, succeeds Mr. SOMMERVILLE as night operator at Sacramento, Cal.

Mr. NED PEARSON is at Oakland Wharf, C. P. R. R., suffering from Mr. ARCHIE LISTER, who is suffering from a severe illness.

Mr. THOMAS R. KNOX, recently of the Atlantic and Pacific, Sacramento, Cal., office, arrived in New York per steamer from Panama on Monday last, in good health after a pleasant voyage.

The Telegraph.

By Cable.

THE ANGLO-AMERICAN 1866 CABLE REPAIRED.

LONDON, July 15.—The Atlantic cable, laid in 1866, was successfully repaired yesterday afternoon, and is now in perfect working order.

The Cable Steamship Faraday at Portsmouth.—Delayed by Fog.

THE cable steamship Faraday, for whose safety serious fears were entertained, and whose total loss by collision with an iceberg was at one time reported, fortunately, as it proved, erroneously, arrived at Portsmouth, N. H., on Thursday of last week. She was detained by dense fogs on her return trip from Halifax, N. S., to which place she had gone for coal.

Her consort, the steamship Ambassador, which had been out in search of the Faraday, arrived at Portsmouth on Monday last, and on Tuesday the shore end of the cable was landed, the work being completed on Wednesday morning last.

The cable for the beach at Straw's Point was taken off the Ambassador in the launches specially provided for the purpose, which were on board the Faraday. Operating instruments have been set up in a private house near Straw's Point. Governor Straw and other distinguished men were at the Point. Bonfires were burning on shore; rockets sent up from the Ambassador and private residences, and the scene Tuesday evening is represented to have been one of great animation and interest.

After completing the laying of the cable at Straw's Point the Faraday and Ambassador sailed for Torbay, N. S., from which point the cable will be laid to the coast of Newfoundland, after which the Faraday returns to England and will load the balance of the cable and proceed to lay it from the coast of Ireland to the Newfoundland coast, where the ends will be connected, and, unless some unanticipated difficulty should be experienced, the new line will be in working order. After successfully operating it for thirty days, Messrs. Siemens Brothers, the contractors, will turn it over to the Direct United States Cable Co.

Wreck of Cable Steamer Gomos.—Telegraphic Communication in South America delayed.

A PRESS communication from Rio Janeiro, dated June 7, gives the following details of the wreck of the cable steamer Gomos:

"The British steamer Gomos, engaged in laying the telegraph cable on the southern coast of Brazil, has been wrecked with about one hundred miles of cable on board, though no lives were lost. This disaster will postpone through cable communication with the River Plate for six months longer, as she was landing an end at Rio Grande du Sol, for the purpose of laying the cable between that city and the frontier of Uruguay, when she was lost, and with her the cable intended for that last wanting link. It is also reported that the cable on the Uruguayan coast has parted. On the other hand, the Uruguayan land lines have reached within twenty miles of the Brazilian frontier, and should join on with the Rio Grande lines by July; but the Brazilian lines, whether government or private, are proved so unreliable that little account is made of them."

Foreign Telegraphic Notes.

THE directory of the Transandinian Telegraph Company have been informed by the manager of the River Plate Telegraph Company that he expects telegraphic communication to be established with Rio, Pernambuco and Para by the end of August.

The manager of the West India and Panama Telegraph Company's cables is now in Cayenne, superintending the laying of a submarine cable from Para to Demerara, which will connect Jamaica in six weeks with Para, Pernambuco, Bahia, Rio de Janeiro, Montevideo, Buenos Ayres, Valparaiso, Chili and Bolivia.

The number of messages forwarded from postal telegraph stations in the United Kingdom, during the week ended the 13th June, 1874, was 375,174—an increase on the corresponding week of the previous year of 35,402.

The first report and statement of the liquidation of the French Atlantic Telegraph Company was to be submitted by the liquidators at a meeting summoned for the 26th ult. After making a sufficient reserve to meet further contingencies and expenses the liquidators propose to distribute 4s. per share.

At an extraordinary general meeting of the West India and Panama Telegraph Company, the special resolutions adopted on the 30th May, for the increase of

the capital to £1,900,000, the purchase of the Central American, and other matters were unanimously confirmed.

New South Wales, Queensland, and New Zealand have ratified the arrangements for a duplicate cable *via* Normanton.

The total number of messages forwarded from postal telegraph stations in the United Kingdom, for the week ended June 20, 1874, was 388,651—an increase on the corresponding week last year of 47,100.

The directors of the Eastern Extension, Australasia and China Telegraph Company, have declared an interim dividend, for the quarter ending 31st March, at the rate of 6 per cent. per annum, or 3s. per share, free of income tax.

The directors of the Eastern Telegraph Company have notified that, subject to the final audit, the accounts show a balance which will enable a dividend to be recommended, at the meeting on the 14th July, of 4s. per share, making, with previous payments, 6 per cent. for the year ended the 31st of March, carrying to reserve about £39,000.

Telegraphic and Electrical Brevities.

A TELEGRAPH cable from Long Island City to New York was cut Tuesday afternoon, and the wire stolen. The thief was arrested at a late hour Tuesday night.

A general meeting of the stockholders of the Southern and Atlantic Telegraph Co. will be held at the executive offices of the company, No. 51 New street, New York, Wednesday, July 22.

Specimens of the different sizes of cables manufactured for and used by the Direct United States Cable Company, now being laid for that company between the United States and Ireland, are on exhibition in the receiving office of the Atlantic and Pacific Telegraph Company, No. 198 Broadway, New York, and attract much attention.

The Duplex System on Long Submarine Cables.

THE *Telegraphic Journal* of London, in its issue for June 15th, publishes a communication from Mr. C. V. De Santy, under date of Gibraltar, May 25, as follows: "It must prove interesting to your readers to learn that the possibility of working the duplex system of telegraphy on long submarine cables is no longer a matter of doubt.

"After fourteen months of experiments I have at length succeeded in obtaining very satisfactory results on the Gibraltar and Malta cable (1,121 nautical miles), and do not doubt but that on receiving some additional instruments I shall be able to practically establish permanent correspondence between Gibraltar and Malta on this system."

The Brazilian Telegraph.

WE congratulate the shareholders of the Construction and Maintenance Company upon the success with which the laying of the Brazilian Telegraph has been carried out. The work is not only one of great importance as a means of direct communication between Europe and South America, but will, in a financial point of view, be of great service to the Eastern Telegraph Company, in bringing additional traffic to their cable at Lisbon, where they are connected with each other. The contract price was £1,400,000, and a very large portion of that amount is clear profit, and will go to reward the shareholders of the Construction and Maintenance Company for their enterprise. As is usual on such occasions, courtesy takes precedence of commerce, and complimentary messages have been flying through the cable from and to Brazil. The Emperor is so elated that he is profuse in his congratulations. We know not whether he has communicated with any of the private friends he acquired during his recent visit to this country, but, as a member of the Geographical Society, he has requested Sir H. Rawlinson to convey to his *confidres* his acknowledgment of the favorable manner in which they received him. The rates per twenty words from any telegraph station in Great Britain or Ireland are as follows: To Madeira, £1 1s. 6d.; to St. Vincent, £2 17s. 6d.; to Pernambuco, £6 2s.; to Bahia and Para, £8 6s.; to Rio de Janeiro, £9 6s.; to Monte Video (by post from Rio de Janeiro), £9 7s.; to Santos, Santa Catarina and Rio Grande du Sol, £10 9s.; Half these rates for every additional ten words. Postage to the Gold Coast and Cape of Good Hope from Madeira or St. Vincent, 1s. 6d. Arrangements have been made for homeward messages, by which telegrams from all places in postal communication with Madeira and St. Vincent may be forwarded to their destination by telegraph immediately on the arrival of the mail steamers.—*The Railway News.*

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Table with columns: JULY, WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows of stock prices for days 9-15.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each.

For the week ended June 16, 1874, and bearing that date.

152,031.—ELECTRICAL TEMPERATURE REGULATOR.—William C. Baker, New York, N. Y. Application filed March 27, 1874.

Temperature raised too high causes the thermostat to close circuit to a magnet, shutting off warm air and admitting cool air.

152,199.—TELEGRAPH KEY.—Raudall W. Walker, Oxford, N. Y. Application filed April 25, 1874.

The improved telegraph key for transmitting despatches simultaneously over several lines, composed of insulated plates A', as many as there are lines to be connected, which are provided with s'awtooth projecting front and rear lugs or extensions e e, for attaching the contact screws and connecting wires, substantially as set forth.

For the week ended June 23, 1874, and bearing that date.

152,281.—TELEGRAPH RELAY.—Patrick B. Delaney, Washington, D. C. Application filed November 28, 1873.

Armature at each end of magnets having retractile springs of different tensions. One armature sometimes directly in main line circuit, so as to completely break such circuit, giving notice that line is in use, even in "leaky" weather.

- 1. A relay having two armatures and two armature levers, capable of different adjustments, substantially as and for the purpose set forth.
2. In combination with a relay magnet having two armatures, the additional magnet, substantially as and for the purpose set forth.
3. In combination with a telegraphic circuit, an armature and its stops, arranged to momentarily break such circuit on the movement of the armature between its stops, substantially as and for the purpose set forth.
4. In combination with a relay having two armatures, one or more sounders, the circuits of which are closed by the movement of either armature of the relay, substantially as and for the purpose set forth.

152,356.—TELEGRAPH KEY.—Theodore M. Foote and Charles A. Randall, Brooklyn, N. Y. Application filed March 20, 1873.

Depression of key lever closes circuit from one pole; elevation reverses circuit.

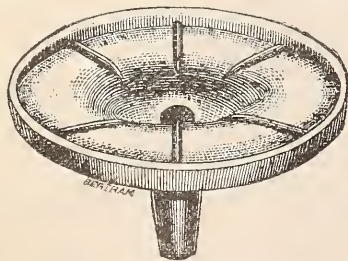
- 1. The combination, with the rocking lever of a key provided with screws, as described, of springs upon which the screws make a sliding contact when the lever is raised or depressed, substantially as described.
2. The screws s' s' s' in a key, K, in combination with a battery, and with circuit connections thereto, substantially as shown, the alternate raising and depressing the lever of said key, causing alternate positive and negative currents to be sent over the main circuit.

EXTENSION.

28,874.—IMPROVEMENT IN POST HOLE DIGGER.—Granted to John Lee, June 26, 1860.

- 1. The hollow self-discharging digger, constructed and operating as set forth.
2. The wheel A and levers B, in combination with the digger C, operating as described and for the purposes set forth.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

TO ELECTRICIANS AND INVENTORS.

OFFICE OF THE UNION ELECTRO-MOTOR CO., 62 BROADWAY, NEW YORK, July 8, 1874.

The attention of Electricians and Inventors is invited to the following proposition: The

UNION ELECTRO-MOTOR COMPANY

Desire to procure a

GALVANIC BATTERY

Fulfilling the following requirements:

- 1. It must be capable of maintaining a steady current of 6 farads per second through a resistance, external to the battery, of two tenths of an ohm, with not more than six pairs of plates. This is, approximately, equal to the current developed by 3 of Chester's No. 2 carbon cells, charged with mixed nitric and sulphuric acid in the porous cells through 50 feet of No. 18 copper wire .049 inches diameter.
2. It must be absolutely free from fumes, and from liability to leak or spill its contents under any ordinary circumstances. If possible, it is desirable that a battery should be provided to work without liquids—in other words, a dry battery.
3. It must be capable of standing for a considerable length of time unused without material depreciation, and yet be ready to give out its full power at a moment's notice whenever required.
4. It must be self-supplying to an extent which will render it capable of furnishing a current, as above stated, for not less than 300 hours in succession without renewal.
5. Other things being equal, preference will be given to the battery occupying the smallest space.
For the best battery fulfilling the requirements herein specified a premium of

FIVE HUNDRED DOLLARS

will be paid, in accordance with the decision of the judges, if the battery is adopted by the company—which shall also have the privilege of exclusive ownership by paying the additional sum of

FIFTEEN HUNDRED DOLLARS.

This offer will remain open until November 1, 1874.

Judges.—MARSHALL LEFFERTS, President of the Gold and Stock Telegraph Company; GEORGE B. FRESCOTT, Electrician of the Western Union Telegraph Company, and FRANK L. POPE, Electrician.

E. B. GRANT, President.

H. H. DUNCKLEE, Secretary.

THE "SNAPPER" SOUNDER.



TRADE MARK. PATENTED MAY 12, 1874.

POLISHED, 30c., OR 6 FOR \$1.50.

POLISHED, WITH NICKEL-PLATED SPRING, 40c., OR 6 FOR \$1.80.

POLISHED, WITH KNOB AND SCREW FASTENINGS, 75c.

PRICE, 75 CENTS.



Sent post paid on receipt of price.

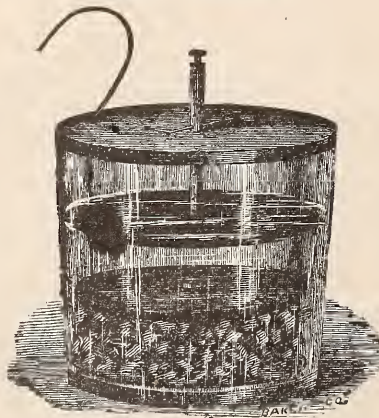
R. W. POPE, Box 5278, N. Y.

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HAMILTON, ONT., Agents for the Dominion.

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

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Messrs. PARTRICK, BUNNELL & CO.

herby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

22 DEY STREET, NEW YORK,

where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL

AND SUPPLIES OF EVERY DESCRIPTION.

AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in

CHAMPION LEARNERS' INSTRUMENTS,

NEW GIANT SOUNDERS, PERFECTED,

IMPROVED CURVED KEYS,

ELECTRIC BELLS, IN GREAT VARIETY,

NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED

LIGHTNING ARRESTERS,

LATEST AND BEST FORMS OF GRAVITY BATTERIES.

Together with LINE WIRE,

OFFICE WIRE, BRACKETS,

INSULATORS, LINE TOOLS, ETC.

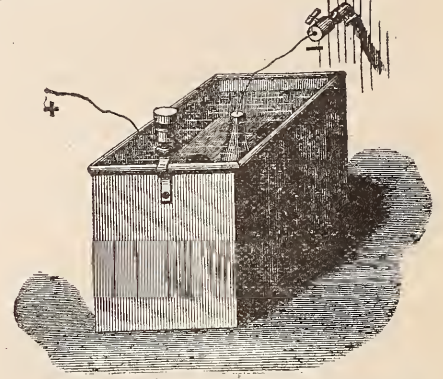
Send for Catalogue and Price List.

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22 DEY STREET, NEW YORK.

38 South Fourth Street, Philadelphia.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

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IF YOU WANT

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TELEGRAPH LINE,

ORDER OF

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They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY THE BEST.**

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EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

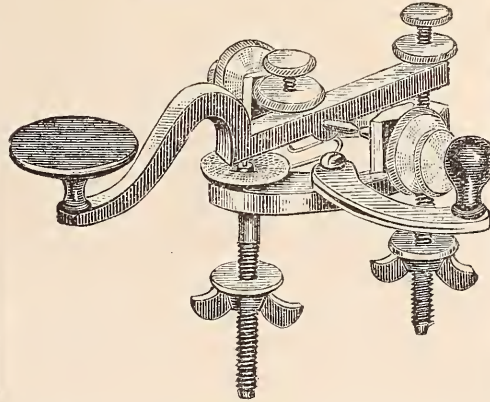
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We are offering 20 per cent discount from list prices on all instruments of our manufacture.

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BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
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SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

**THE BEST TELEGRAPH MATERIAL
IN THE WORLD
AT THE LOWEST PRICES!**

The prices on our Catalogue are very low, but we are offering 20 per cent. discount from them on all Telegraph Instruments of our manufacture.

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COMPARISON OF RATES.

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The Distinctive Features of these Systems of

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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

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the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

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Messrs. GAMEWELL & CO. are the owners of the original FARMER & CHANNING PATENTS, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by MORE THAN TWENTY PATENTS.

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The American System of

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has met with the universal approbation and commendation of the

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NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

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SUBTERRANEAN & AERIAL WIRES,

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We have made special arrangements to furnish this article for office purposes at a reduced rate.

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of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

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INSULATOR WORKS,
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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TELEGRAPH LINE WIRE.
COPPER FOR CONDUCTIVITY.
STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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FOR
RAILROADS, GAS COMPANIES AND PRIVATE BUSINESS PURPOSES GENERALLY.

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This Instrument is offered to the public as the oldest, most rapid, and best.

MAGNETO-DIAL TELEGRAPH
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It has already been extensively adopted and has invariably given entire satisfaction.

They also manufacture and put up
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which is the best watchman's time recorder in the world. Also,
ELECTRIC AND CONTROLLED CLOCKS
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OF ALL KINDS.

All instruments and work from this establishment guaranteed to give satisfaction.

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MANUFACTURERS AND DEALERS IN
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EVERY DESCRIPTION,
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NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

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**RELAYS,
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REGISTERS and KEYS.**

In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
of all kinds, etc., etc.

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For Amateurs and Learners, and Short Lines.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,**

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

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EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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THE TELEGRAPHIC MANUAL,
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A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muscheubrock, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollastou, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Heury, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

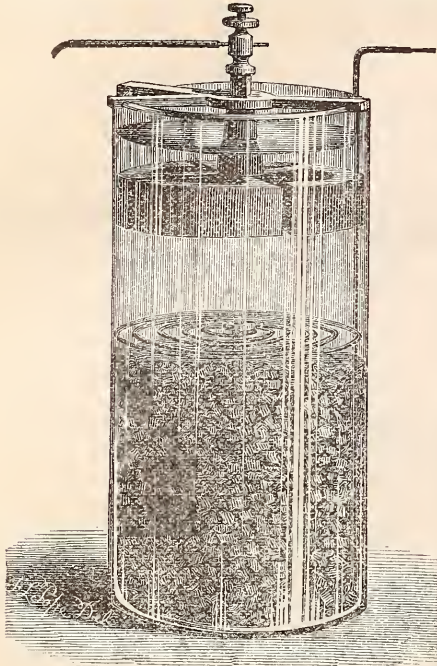
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given. The publishers will be announced hereafter.

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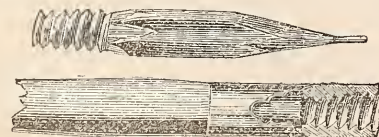
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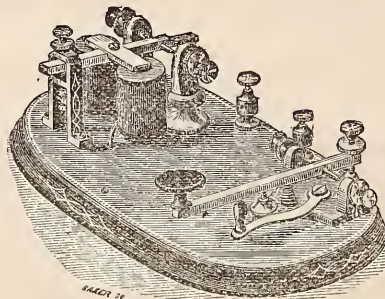
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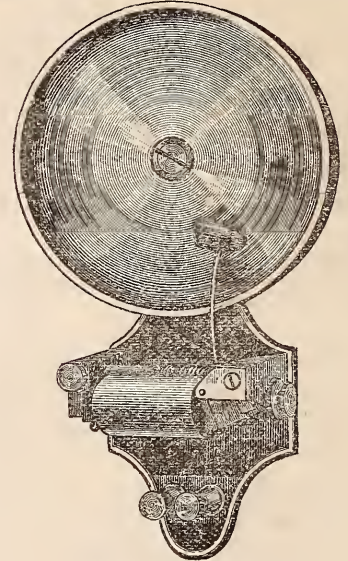
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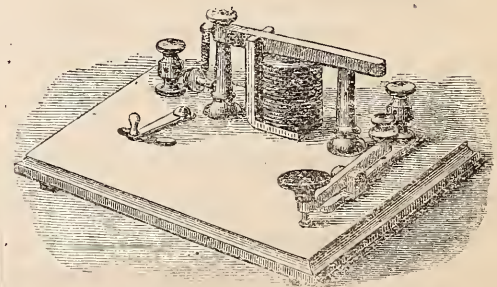
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The Telegrapher

A Journal of Electrical Progress

Vol. X. New York, Saturday, July 25, 1874. Whole No. 419

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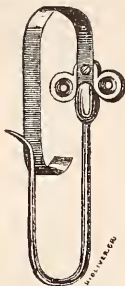
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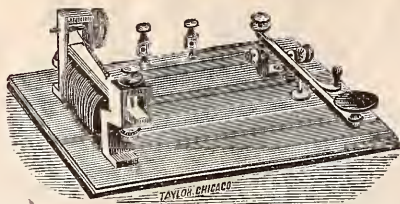
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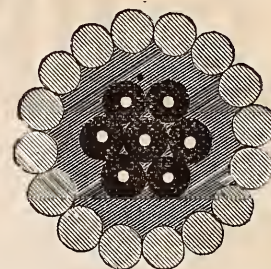
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, JULY 25, 1874.

VOL. X. WHOLE No. 419.

Original Articles.

Little's "Condenser Rheostat,"

As used by the Automatic Telegraph Company.

It is well known to telegraph scientists that the effect of an iron core introduced into the centre of a retarding coil or helice will be to assist (in addition to the accumulative resistance of the coil itself) in the accumulation of more current; in other words, the current allowed to escape by way of the overflow dam will become more retarded; for, until the current allowed to escape (by way of what I term the overflow dam rheostat) becomes retarded, condensed or accumulated, the iron core will not become magnetized, but, on breaking circuit, the coils will absorb the residuum (if any) stylus current and thereby prevent the same from following the path to earth (offered by my canary colored prepared paper), by sudden absorption of the same, the coils or helices assuming in this case the function of any properly constructed condenser or accumulator made for such purpose. In either case the current so absorbed would go to earth by way of the rheostat at the receiving end of the line.

Since the use of iron cores by myself, in 1868-69-70, I have preferred the ordinary condenser, when properly constructed. The introduction of iron cores, to augment the accumulative power of the coils or helices, was discovered by and used by Romagnose in 1802, and by Sir Charles Wheatstone, Preece, Culley, and many others since. To the first use of which (by me) in an automatic chemical telegraph, and of which there are many forms, I hold a broad claim.

There are also many forms of the (my) overflow dam (to earth) rheostat, used with a condenser, as also an accumulator, or condenser itself, to which, in an automatic chemical telegraph, I also hold a broad claim, by virtue of patents applied for and obtained since 1869.

In the provisional specification of my English patent (for my automatic telegraph system), No. 1,207, April 22, 1872, I state that it is necessary to regulate the force of the electric currents. For this I use an adjustable rheostat similar to that in my English patent, No. 2,286, of 1871; and the electro-magnet or magnets are put inside the rheostat. In cases where the rheostat requires to be very compact, the same is made with a series of small coils inserted in the bed and connected with conductors, over which the adjuster slides, to make connection "through ONE or MORE of those coils."

GEORGE LITTLE,
Consulting Electrician to the Aut. Tel. Co.; Inventor of and
Patentee of the American Automatic Telegraph System.

Passaic City New Jersey, U. S. A., July, 1874.

INSTRUCTIVE POSTSCRIPT.

(Extracts.)

* * * * The Little's "Automatic System."
* * * General MARSHALL LEFFERTS, Engineer in
Chief, Western Union Telegraph Company, October
21, 1869.

Little's automatic telegraph process. * * * I
have thought much on the subject, and desire to re-
iterate, with emphasis, what I have said before. The
results obtained by this method are surprising. GEO.
B. HICKS, General Agent of the Western Associated
Press, Cleveland, O., January, 1868.

By the Little's automatic system twelve columns
of the *New York Herald* can be transmitted and re-
ceived (over one line wire) in one hour. D. H. CRAIG,
Ex-General Agent of the New York Associated Press,
December 1, 1869.

In the fall of 1870 the editor of the *Scientific Ameri-
can* recorded from personal observation the receipt of
600 words per minute in clear, sharp signals.

Automatic or Cheap Telegraphy.—This great de-
sideratum has been accomplished by Mr. George
Little's method of manipulating the electrical currents.

* * * On the 5th of February, 1872, we made the
automatic test between Charleston, S. C., and New
York (over 900 miles). That test was satisfactory.
Hon. GEORGE HARRINGTON, President of the Auto-
matic Telegraph Company.

* * * Please call on the Hon. George Harrington,
the President of the Automatic Telegraph Company,

* * * and he will show you that the world does
not stand still. HIRAM BARNEY, June 24, 1872.

The Hon. William Orton, President of the Western
Union Telegraph Company, January, 1873, concedes
that 12,000 words were transmitted in legible signals
over a circuit of 300 miles in 34 minutes.

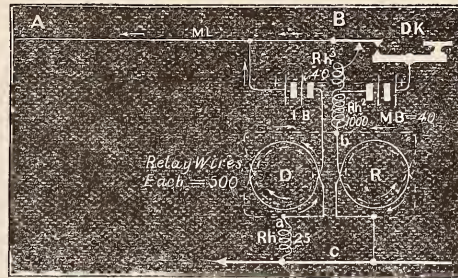
An eminent electrician in her Majesty's Postal Tele-
graph Department, writing to me under date of Febru-
ary 10, 1874, and April 8, 1874, says the automatic ex-
periments here were very successful. * * * * We
in England are watching with much interest the char-
acteristic growth and advancement of telegraphy in
America, and we are quite willing to learn and to be
taught. G. L.

Duplex Telegraphy.—A Combination of the
Bridge and Differential Systems.

In the diagram of my duplex apparatus, published
in THE TELEGRAPHER of July 4th, the resistance or
battery operated by armature *a* at A should have been
shown the reverse of what it actually was—that is, a
like pole should be towards I B same as at B, except +
poles are connected at B, and — poles at A. I send
you the following, which I consider an improvement
in the arrangement above mentioned:

By a combination of the differential and bridge prin-
ciples, as shown in the annexed diagram, all of the re-
ceived current affects the receiving instrument.

The outgoing current from terminal B is prevented
from going to ground G through the I P branch, by
being met by a like pole, *c*, of same potential as the
pole *c* of main battery M B, from which it started, and
is prevented from operating receiving instrument at B
on its return to zinc pole *z* of battery M B, by having
three routes to traverse at B, viz: from ground G to
junction *b*, around limb R of a differential duplex
relay, is one route of 500 ohms resistance; second,
from G through rheostat Rh of 250 ohms, from junction



a on bridge wire around relay spool R, in an opposite
direction from that of first route, thence to junction *b*;
and third route from junction *a*, on the branch of bridge
wire around spool D, in an opposite direction from that
of the other wire on same limb (i. e., in same direction
as the other bridge branch around limb R), thence to
junction *b*, where the three currents reunite and flow
to *z* of M B, through a rheostat Rh² of 1,000 ohms.
Now, one half of said returning current flows through
first route, because the other two routes together are
of same resistance as first route, viz., Rh 250 and
 $\frac{500 + 500}{2} = 500$ ohms; the other half divides equally
at junction *a* on bridge, thus one fourth of the return-
ing current flows around each limb, both in an oppo-
site direction from first half, and neutralizing the effect
of first half of returning current upon relay, i. e., the
two halves neutralize each other, and relay remains un-
affected, for all its wires (4) are exactly alike in resist-
ance and number of convolutions. All of the out-
going current, from A through the earth to B, has its
full effect upon the receiving relay D R at B, thus:
from ground it takes only two routes—first, through
limb R of 500 ohms and rheostat Rh² of 1,000 ohms—
1,500 ohms in all, exclusive of battery resistance;
second, through rheostat Rh of 250 ohms, and around
limb D of 500 ohms—750 ohms in all; therefore, twice
as much of current from A affects limb D as it does
limb R, yet none of it passes over bridge, because the
proper proportion for maintaining the "balance" is
never changed while operating, or by line variation, for
whenever the duplex sending key D K is opened rheo-
stat Rh² is thrown into R branch, having same resistance
as the battery M B, without breaking the main line M L
connection, in same manner as common duplex sending
now in use. For the sake of simplicity I have omitted
the battery resistances, which can be provided for, and
the resistances changed to make the incoming current
equal in both spools of relay, or nearly so, and at same
time lessen the general resistance. The "bridge" pro-
portion or balance, according to this description, is
500 : 1,000 : : 250 : 500—the two ends of bridge being
connected to branches between first and second
couple, i. e., one end between 500 and 1,000 and the
other end between 250 and 500. If I understand the
action of the static charge or return stroke provided
for in present duplex systems by a condenser, in my
plan it will neutralize itself by taking the Rh² branch,

dividing at *b* and flowing in opposite directions through
D R in equal parts.

Both terminals are exactly alike, except at A the
arrangement is to earth, and at B to line with + poles.
I claim this as my invention.

SIMEON J. M. BEAR.

Mitchell, Iowa, July, 1874.

Telegraphs in Mexico.

THE following statement, in regard to the telegraphs
in the neighboring Republic of Mexico, is from the
official report presented to Congress by the Depart-
ment of Public Works:

"Of the lines thus far in operation some belong to
the Federation, some to the States, and others to private
companies.

"The following telegraphic lines belong to the Fed-
eration:

"The one which starts from the City of Mexico
passes through Cuautitlan, Tepeji del Rio, Arroyozarco,
San Juan del Rio, Querétaro, Allende, Dolores Hid-
dalgo, San Felipe, San Luis Potosi, Montezuma, Char-
cas, Matehuala, Salado, Gomez, Farias, Saltillo, Mon-
terey, Cadereita Jiminez, Cerralvo Mier, Camargo,
Reinosa, and the Port of Matamoros; there being a
telegraph office at each one of the twenty-three places
mentioned, and comprising a distance of 1,400 kilom-
eters in length. At Matamoros this line connects with
those of the United States and consequently with Euro-
pe.

"The line which leaves Querétaro passes through
Celaya, Salamanca, Irapuato, Guanajuato and Leon,
with branches to Salvatierra, Valle-de Santiago, Pen-
jamo, Chitzeo, and Dolores Hidalgo—telegraph offices
being established in each one of the places men-
tioned; the length of this line with its branches is 398
kilometers.

"That which starts from the City of Mexico, 222
kilometers in length, and which passes through Toluca,
Ixtlahuaca, Tlapujahua, and Maravatio, from which
latter point it communicates with Salvatierra, closing
the circuit at Celaya, which facilitates communication
between the capital of the Republic and the interior
lines, independently of that which is established *via*
Querétaro.

"The telegraph line which passes through Tacnabaya,
San Angel, Tlalpam, Cuernavaca, Puente de Ixtla,
Iguala, Chilpancingo and Tixtla Guerrero, comprises a
distance of 376 kilometers, and will be continued as far
as the port of Acapulco. (The line has been finished
to the said port since the publication of the report
from which these data are taken.)

"The line which starts from the port of Mazatlan
and passes through Coacucodia, Pánuca, Copala, Ceyto-
es, Durango, Nombre de Dios, and ends in Chalchihui-
tes, is 498 kilometers in length.

"The line from Tehuacan to Oaxaca, which, is 251
kilometers in length and passes through Teotitlan and
Cuicatlan.

"The line which starts from Minatitlan and is to place
in communication the States of Vera Cruz, Tabasco,
Campeche and Yucatan with the capital of the Re-
public; two sections of the said line are already in
operation—one from Minatitlan to San Juan Bautista,
and the other from Campeche to Champoton. The
whole line when finished will be 639 kilometers long.

"The following telegraph lines also belong to the
Government: Those established in the States of Yu-
catan and Campeche, with offices at Mérida, the port of
Progreso, Sisal, Huemanac, Tixkokob, Izamal, Acan-
cek, Mama, Tzul, Tekax, and Maxcanun in Yucatan,
and in Kalkini, Tescelcachan, Iturbide, Champoton and
Campeche in the State of the same name. These lines
are 520 kilometers in length.

"The State of Zacatecas owns the line which begins
at San Luis Potosi and passes through Ojo Caliente,
Zacatecas, Fresnillo, Sombrerete, Chalehuhites, Aguas-
calientes, Jerez and Villanueva; this line is 660 kilo-
meters long. The State of Michoacan owns the line
which starts from Salvatierra and passes through
Acámbaro, Maravatio, Morelia, Pátzcuaro and Arío.
This line is 190 kilometers in length.

"The line of the Jalisco Company which starts from
Leon, passing through Lagos, San Juan de los Lagos,
Aguascalientes, Pegueros, Tepatitlan, Zapotlanejo,
Guadalajara, Tepic and San Blas, and a branch from
Guadalajara to Zayula, Zapotlan, Colima, and the port
of Manzanillo, is 930 kilometers long.

"The Vera Cruz Telegraph Company owns the lines
which start from the said port and run, one to Mina-
titlan and another to the port of Tampico; the former
passing through Alvarado, Tlacotalpam, Tuxtla and
Acayucan, and the latter through Jalacingo, Papantla
and Tuxpan.

"The line which runs from this city to Vera Cruz,
passing through Riofrio, Puebla Acatzingo, la Cañada,
Orizaba, Córdoba and Vera Cruz, also belongs to a
private company; and the other line, which follows
along the Mexican railroad as far as Nopalucan, and
then passes through Tulacingo, Perote, Jalapa and
Vera Cruz. This company, likewise, own the lines

from Mexico to Pachuca and Tulancingo, from Puebla to Tehuacan, from Puebla to Tlaxcala, and from Mexico to Chalco and Ameca.

"The telegraph of the Mexican Railway Company goes from this capital to Vera Cruz, following the railroad and the branch to Puebla.

"The extent of telegraph lines already in operation and being constructed in the Republic is as follows:

Owned by the Government.....	3,802	kils.
In course of construction.....	1,050	"
Owned by the States.....	970	"
Owned by private companies.....	2,179	"

Total number of kilometers.....	8,001
Or, about.....	5,000

"The total number of telegraph offices owned by the Government is 73."

The Lightning's Vagaries.

THE house of Mr. E. W. B. Canning, a well known resident of Stockbridge, Mass., was struck by lightning during the storm of June 7th. Mr. Canning was absent at the time and did not return until some three weeks afterwards. The singularity of some of the phenomena, of which the effects were still distinctly visible, led him to furnish the following detailed and interesting account of them to the *Springfield Republican*. He writes:

"My house is furnished with a rod, which is fastened to the west chimney of its front portion, running through proper insulators down the north side over the tiled roof of an eight feet projection and entering the ground deeply, some thirty feet from the place where the traces of the lightning remain on the outer and inner walls of the building. Several trees—maple and elm—stand near the house, whose tops exceed the highest point of the rod, one of the former being less than ten feet from and directly opposite the place where the unwelcome visitor seems to have made its exit. The bolt appears to have been divided; for that the conducting rod did its duty, in part, at least, is proved by one of the family, who was in the act of closing a window immediately in front and not ten feet from it, and who saw the fluid pour along down it like a stream of molten silver. To the others of the household, who were seated in the library—one of the front rooms—the remainder of the bolt, as it entered the room, resembled two balls of fire, one bursting through the wall and the other rolling along the carpet. The simultaneous flash and crash stunned and blinded them for a few moments, all receiving a shock more or less intense. The room was entirely dark at the time, and it was not until a transient lull in the storm that an investigation revealed the results of the explosion. The apartment was filled with a sulphurous odor, mingled with that of burnt woolen. The western portion of the library is an extension of six feet beneath an arch, and its ceiling is some eighteen inches lower than that of the main room. A double window, reaching to the floor, divides its western wall, on either side of which hangs a picture from hooks attached over a grooved chestnut cornice. Directly over the southernmost of these hooks is an orifice about an inch in length by a quarter in width, pierced by the bolt. Thence to the picture frame the cord was blackened, and several inches of a small copper wire with which it was slightly wound were fused. On the wall near the cord ring on the frame a ragged and irregular hole, as large as an ordinary man's fist, is torn through the plastering, from whose edges, burned inward, it might be inferred that there the fluid entered the room. But the lathing beneath is indented outwardly, as though it had been struck by a heavy, round-faced hammer. The plastering was thrown, in the finest powder, over even the farthest portions of the room. The closest search has failed to discover where the fluid entered the house externally, through wall or roof; but, from the casing outside, under the clapboards and about five feet below the hole in the library, a splinter, some two feet by three inches, was torn off and thrown twenty feet away, revealing beneath two large nails, whose attraction probably determined its point of departure. Thence it seems to have leaped into the earth on the edge of the terrace, and close to the roots of the nearest maple, scooping out the soil like the path of a cannon ball into a hillside. Clumps of turf were thrown upon the sill of my neighbor's window, more than thirty feet distant.

"But to some of the more peculiar features of the case: On the satin-faced buff paper of the library, and directly under and on both sides of the picture cord, there is portrayed the versimilitude of a vine, with leaves alternate, dashed with great distinctness, and in color a very dark bronze. Seven or eight leaves are distinguishable, growing smaller and less distinct toward the ceiling. Their shape resembles that of an ivy leaf, a sprig of which was trimmed over the arch, six feet before it, and which was loosened and thrown down by the shock. I am half inclined to consider

this a specimen of the photographing process of the electric fluid, occasionally recorded in descriptions of the effects of lightning. The copy is so true as to have deceived me, when I first saw it by lamp light, into asking where that vine came from. Students in physics will recall what I mean; instances of which, though uncommon, are yet by no means unknown, where images of objects immediately in front of the operating fluid are faithfully portrayed upon a neighboring surface. Only yesterday a gentleman gave me an instance in the case of his brother, who was instantly killed by lightning, a week ago, in Virginia. He was sitting near and opposite an open window, and on a hillside in front of it stood a dead tree towering with huge limbs over the humbler vegetation. On preparing the body for burial this tree was found most faithfully copied beneath his clothing upon his breast. The vine before mentioned more nearly corresponds with such facts than anything that has occurred in my own experience hitherto.

"Another curious fact, unnoticed till some days after the occurrence, is this: The ceiling of my library was replastered last May. A queer pox-marked appearance on portions of its originally smooth surface led to a revelation that small pieces had been nicked out all over it. This I attribute to the tinge of iron in the graules of the sand in the mortar (all the sand herabouts is thus affected) attracting the fluid and causing their dislodgement. If this be true, it proves the universal pervasion of the subtle agent through the premises.

"The storm during which all this happened was more severe and of longer duration than any remembered by 'the oldest inhabitant.' The dwellers on the heights above the village say that it was the meeting of two highly charged clouds, that were observed to follow each a range of hills on either side of our town, and, coming in contact at the point of the valley, paused and 'fought it out on that line' from eight o'clock Sabbath evening till three next morning, and then, seemingly exhausted, went growling down the Housatonic.

"A singular phenomenon in the vegetable world appeared so directly after that elemental conflict as to warrant the belief of our fruit growers that it is attributable thereto. On many of the fruit trees, particularly the pears, there was, next day, observed a blight, which, without scarring or crisping the leaves, turned them entirely black—in some cases the foliage of solitary twigs, and again that of whole branches.

"During the storm several dwellings in our town were struck with greater damage than my own. A few beasts were killed, and fields, meadows, gardeus, and particularly highways, badly washed by the floods that fell. But a more enduring *souvenir* has been left upon the side of Monument mountain in a huge furrow, which, as seen from the village, suggests a giant's grave scooped in the dense forest during that night of terror. I am informed that it is some thirty rods long by two or three wide, and looks like the path of an immense shell along the earth, tearing up trees, rocks and soil, and throwing them into a chaos of debris on every side. It is not a gully occasioned by a water-course, but bears rather the marks of a tremendous thunderbolt ploughing its furrow along the ground."

Telegraphers' Annual Reunion.

THE sixth annual reunion of the Western Union Telegraph operatives of this State was held in this city Saturday, the Fourth of July. At a meeting of the telegraphers of this city, held on June 15th, to make arrangements, the following committees were appointed:

Committee on Invitation.—P. K. Jones, Rochester; W. F. Drake, Rochester; P. G. Wright, Rochester; John Kelly, Syracuse; A. J. Schall, Syracuse; Tom Graham, Auburn; A. L. Howe, Utica.

Committee on Reception.—Vincent Marling, H. P. Mulligan, C. A. Wickhouse, P. K. Jones, P. G. Wright. The majority of the lightning operators arrived by lightning train at 11.20 P. M. Friday, and the balance on the early train Saturday morning, and were quartered at the Brackett House, which Hildreth & Bro. run by lightning. There were about seventy-five in the party, and, after having gone through Jim Erwin's culinary department, they were escorted by Messrs. Butler, Mulligan, Redman and other employes of the Rochester office to a commanding point to witness the grand procession. After "taking that in" they were marched to the Western Union office, thence to the Brackett House. There they met the Syracuse and Auburn delegations, and the party boarded the street cars and proceeded to the Bennett House, where they found the steamer Falling Waters awaiting their arrival. Just after the boat started the rain came down in torrents, but the boys kept under cover. The rain soon stopped falling, and the ride down the river was greatly enjoyed, the party taking observations from the deck of the steamer. They landed at the Spencer House, and immediately "struck out," by way of the beach,

for "The Cottage," where H. S. Moody & Son took them in charge. "Hod." furnished them with refreshments, and made them feel at home during their short stay. The telegraphers, before leaving, formed in front of The Cottage in the shape of the latest comet and gave "Hod." three lightning cheers. His Honor appeared on the balcony uncovered, and made a speech that would have done credit to that veteran pisciculturist, Seth Green. The comet's tail was straightened, the line again formed, and the party, "in a body," proceeded to Manager Cheney's cottage, where they were warmly welcomed by Mr. C. and his family, who had preceded the party. After a pleasant time here, enjoying the lake breezes, viewing the cottages that line the beach, and getting an idea of our popular summer resort, they boarded Conductor Smith's lightning train and were whirled back to town. The party desire us to extend their thanks to Conductor Smith for favors rendered. Then came the dinner in the spacious dining room of the Brackett House. The *table d'hote* was all that could be desired. Nothing was left undone to please the guests, and the Messrs. Hildreth and James Erwin were given a vote of thanks for their efforts in behalf of the lightning party. The "phunnists" of the party were Charles E. Stag and C. A. Scheffer, of Elmira; Brown, of Corning; Palmer, of Palmyra, and Schawl, of Binghamton. They made several "bulls," however, and were "cashiered" before leaving town. After the banquet the party went through Powers' block, tower and all, and then repaired to the river bank, where they were placed upon telegraph poles and witnessed the boat races. The Erie operators left on the 5 P. M. train for Buffalo, via Avon, thence to their posts of duty. Several of the Central operators remained until yesterday afternoon. All were highly pleased with the manner in which they were entertained while here. We found all of them gentlemen, and should esteem it a privilege to meet them again.—*Rochester Evening Express.*

The Telephone.

A CERTAIN malefactor, who hides his individuality under the generic name of Gray, has invented an instrument the awful uses of which he has concealed from the vulgar by calling it the telephone. The telephone is an instrument whereby Gray confesses, or, as he definitely puts it, claims that he can transmit sounds through "an unbroken circuit of 2,400 miles." He has played a piano, a melodeon, a violin, a drum and a tin can at those distances into the astonished ears of a reporter who, "in spite of much talking, had no difficulty in determining what tune the manipulator was playing." So long as this lethal invention is put into practice by the operator at the expense merely of casual reporters, it does no great harm. Perhaps the inventor may be defensed by the reverberation of his own fantasias, but that is of small account. The doubtful legend which attributes to a mediæval monk the invention of gunpowder, goes on to relate that he was blown through the ceiling by a premature explosion. There is something soothing in the thought that the inventor of the telephone may be defensed or driven into howling frenzy by the result of what his mischievous brain has devised. It would be sport to see Gray hoist by his own telephone. But the telephone has larger and more lamentable uses than the extinction of Gray. We spare our readers the dreadful details of how the new telephone works. It is enough that it can transmit sounds for 2,400 miles in such wise that "an accidental false note is immediately detected." The burglar alarm telegraph will at once be profaned to the uses of Gray, and every household hold a hurdy-gurdy. Our sympathies will be on tap like our Croton, and we will turn on Theodore Thomas, and the Philharmonic, and pay our bills quarterly. So far, the telephone is not so bad. But special correspondents know what the operator is capable of in the way of distortion when he is only required to read and transmit the words of what he fondly imagines to be his own language. To what new atrocities he will ascend when to him is also entrusted the transmission of tones no man can tell. Inevitably we shall have telephonic reports of every new opera crashing in the walls. The operator will cry havoc and let slip the discords of the damned, while enraged musicians flee shrieking into the streets, and *prima donne*, listening to the reverberant reports of their own achievements, will expire of grief and shame. The cadenzas of Di Murska will spread over the land, becoming flat and cacophonous as they go, and the false notes of Liszt be flashed under the sea to listening and shuddering nations.

Even this is not the worst. Has anybody reflected what an adjunct to the jubilees of Gilmore the telephone will supply? Hitherto the majority of mankind has borne with complacency the announcement that Gilmore was about to give a jubilee, consoling itself with the thought that it did not live in Boston. Now alienage from the Commonwealth of Massachusetts will be no protection against him. He will fall like dew upon the just and the unjust, and shine alike upon the Phil-

adelphian and New Yorker. One touch of nature will make the whole world kin and crazy, until the outraged race rises in its might to rend Gilmore limb from limb, and defile the grave of the inventor of the telephone.

An Important Legal Decision.

A DECISION, involving very important principles, was rendered in the United States Circuit Court, at Chicago, on Tuesday last, by Judge Drummond, in the case of the Atlantic and Pacific Telegraph Company vs. the Chicago, Rock Island and Pacific Railroad Company. The telegraph company, accepting the Act of Congress of July 24, 1866, entitled "An Act to aid in erecting telegraph lines and secure to the Government the use of the same for postal, military and other purposes," commenced the construction of a line along the route of the Rock Island Railroad, between Chicago and Omaha. The railroad company ordered the telegraph company to desist after a few poles were set. Thereupon the telegraph company applied to the United States Circuit Court for an injunction restraining the railroad company from interfering with the construction of their lines, claiming that, as the Rock Island Road carried the United States mail, it was a post road, and came under the provisions of the Act of 1866.

The railroad company was represented by Messrs. Williams and Thompson, attorneys. It was claimed by them that the Act in question applied only to roads traversing the public domain; that the right of way, which had been condemned and purchased by the railroad company under State laws, was the property of the railroad company, and, under the fifth amendment to the Constitution, could not be taken without compensation.

Judge Drummond, in his decision, held that the Act of July 24, 1866, limits the powers therein conferred to such military and post roads of the United States as are owned or exclusively controlled by the Government; that the Act does not include railroads which have been designated as post routes by other Acts of Congress, over which the Government exercises no control, but simply contracts for the carriage of the mails of the United States; that neither under the Act of 1866 nor under any other Act can Congress take or authorize the taking of the private property of a railroad corporation for the purpose of erecting and maintaining a telegraph line without compensation for the franchise so sought to be granted.

Miscellaneous.

MARINE GLUE FOR WOODEN BATTERY CELLS.—This compound is made by digesting pure India rubber in twelve parts of mineral naphtha, with the addition of gentle heat, which should be done in a safe place. When completely dissolved add twenty parts of powdered shellac; reheat, and stir until the whole is liquified, and then pour out on slabs of slate or polished metal, marble, etc. Cut to convenient size. When required for use melt in an iron pot and apply with a brush. It melts at 248° Fahr.

ELECTRICITY PRODUCED IN MECHANICAL ACTIONS.—Certain phenomena of electricity of tension, observed in leather belting by M. Joulin, have recently been the means of directing the attention of that physicist to the subject forming the above heading. He has constructed machines in which the mechanical tension of the belt can be varied at will, and has used for conducting pulleys the following materials: Iron, brass, zinc, red copper, white iron, lead (the last four metals applied in thin laminae to wooden pulleys); the imperfect conductors, walnut wood, leather, hardened rubber, in sheets of 0.36 inch, applied to wood; cloth and silk fastened in form of cushions, also to wooden pulleys.

In the machines formed of metal and leather, in the latter body electric tensions of surprising intensity were found. Independently of the long sparks obtainable, a metallic wire brought near the belt was traversed with a continuous current powerful enough to deflect the needle of a galvanometer, with electricity of tension to weakly decompose water, and in slightly modified Geissler tubes to produce a distinct stratification of the electric light. The circumstances influencing the electric production may be referred to three causes—separation, more or less rapid, of the bodies; the complex mechanical action of incrustation, depending, in the case of leather, on the elastic state and dimensions of the pulley, and the number of incurvations in a given time; lastly, the common temperature of the two bodies or that of one of them.

The cable box of the Western Union Telegraph Company at Ravenswood, where the wires are united with the cables under the East River, was robbed of several "arresters" on Tuesday of last week.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

Automatic Telegraphy.

NEW YORK, July 16.

TO THE EDITOR OF THE TELEGRAPHER.

EDITORS, reporters and inventors have been unusually occupied of late in discussing the merits and demerits of the various systems of telegraphy which have recently come to the surface, and the stories which have been promulgated in regard to my favorite system of automatic telegraphy are so erroneous and unjust that I cannot allow them to pass without some notice.

To gentlemen, who, like yourselves, are familiar with the history of automatic telegraphy in this country, it must be infinitely amusing to witness the antics of the tribe of ignorant pretenders who parade themselves before the public as "Consulting Engineers and Inventors of Automatic Telegraphy." To General Leferts, far more than to all other inventors in this country, are we indebted for the present American system of fast telegraphy, which was brought before the public in 1869-70 by myself, and its practical success was fully demonstrated by me a year later over a line specially constructed for the purpose between New York and Washington—the same as now used by the Automatic Telegraph Company.

From August, 1870, till near the close of the year the Leferts American system of fast telegraphy was worked at pleasure over 282 miles of wire between the above named cities, at the rate of 500 to over 1,000 words per minute, recording accurately and beautifully.

During the whole fall of 1870 Mr. Thomas A. Edison and Mr. George Harrington were daily visitors at my office, and witnessed rapid and perfect telegraphing—more rapid and more perfect than have been done over the Automatic Company's wire during the past three years; and at that time, 1870, neither Mr. Harrington or Mr. Edison had ever before seen or conceived of automatic or fast telegraphy.

In 1871 the automatic system, fully developed in all its essential parts, was passed under the control of Mr. Harrington, as President of the Automatic Telegraph Company, on the pledge of his ability to raise all the needful capital to build competing lines throughout the country, but which he utterly failed to do.

About the time Mr. Harrington formed the Automatic Telegraph Company he made a secret alliance, in his individual capacity, with Mr. Thomas A. Edison, of Newark, for the purpose of getting up a rival system of fast telegraphy, and during the past three years the Harrington-Edison "Ring" have let slip no opportunity to extol the Edison so-called inventions, which, though of some value in covering up the approaches to fast telegraphy, are in no sense essential to the original Leferts system of 1870—nor does any one of the Edison inventions for transmitting rapidly on long or short circuits equal, and much less excel the Leferts devices.

The "relay magnet," which one enthusiastic but evidently very verdant reporter was made to believe was the crowning invention of Mr. Edison, after "one hundred and twenty-six consecutive nights of experiments in 1873," was in use from the first moment the line was opened, in August, 1870. The relay magnets were continued at every office on the line from that time till it was passed over to Mr. Harrington's Automatic Company in 1871, and Mr. Edison and Mr. Harrington invented the "relay magnet" in 1873, after they had seen it in daily and successful use for several months in connection with the Leferts system, in 1870. Those Edison and Harrington worthies have done a great deal just such inventing as this in connection with fast telegraphy, and it seems to me it is about time their bubble should be pricked.

It is probably true that the Automatic Company have, under Edison's management, adopted some of his devices, as in no other way can I account for the inability of the managers to telegraph recently even 100 words per minute over a circuit which was worked three years ago, before Mr. Edison had anything to do with the automatic system, at a high rate of speed, and can and will be again when the management passes into the hands of gentlemen of practical common sense, who have no fraudulent personal contracts or bogus inventions to bolster up.

Whilst the Harrington "Ring" have been for three years murdering fast telegraphy, by ends attempts to get up a new system, with the idea of wresting from the original inventors and promoters of automatic telegraphy their just rights, other parties have not been idle, and there is now passing through the patent offices of this and all European countries an entirely new system of fast telegraphy, which has been sufficiently tested in my presence to authorize me in say-

ing that it will work and record in circuits of more than 3,000 miles as rapidly and as reliably as the system now in use by the Automatic Company will work in a circuit of 500 miles of land line. But the great feature of the new invention is its adaptability to the working of long cable lines, which its owners are prepared to guarantee at high speed—300 to 500 words per minute—plainly recorded in circuits of 3,500 miles.

If, therefore, the little "Ring" of mutual admirers who now run the automatic machine spend many more nights in experimenting, they will be likely to have their labor for their pains, as the system which they have been so long coddling has become antiquated, and as useless, as a competing system, as the fifth wheel to a coach.

I observe that one of the writers upon this subject quotes Mr. George B. Prescott, the electrician of the Western Union Telegraph Company, as to the utility and value of fast telegraphy. As that gentleman and his chief, Mr. Orton, published labored arguments in 1869-70 to prove that it was impossible for me to telegraph over about 60 words per minute in circuits of 250 miles, whilst I found no difficulty whatever in telegraphing over 1,000 words per minute in much longer circuits, and, at the present time, without improved machinery, can telegraph over 3,000 words per minute with perfect ease, I do not think Mr. Prescott's judgment ought to be accepted upon this subject as of much value. Certain it is that it is quite possible to prove to the satisfaction of any intelligent and disinterested person, that if the Leferts system of automatic telegraphy, as developed by me three years ago, was taken out of the hands of antiquated fossils and ignorant pretenders and put into the hands of practical men, telegraphing could be done far better and at full fifty per cent. less cost than it can possibly be done by any of Mr. Prescott's double or quadruple apparatus for working the Morse system.

Mr. Prescott's statement that unskilled operators cannot work the perforating machines used by the Harrington-Edison people is quite true; but the only reason those crude, lumbering machines are used, is because the invention is claimed (quite erroneously) as belonging to the Harrington-Edison "Ring," and, therefore, must be forced into public use; but there are other perforators infinitely superior to those used in the Automatic Company's offices—perforators which can be correctly worked at sight by any fairly intelligent child of ten years of age; but these simple, cheap and easily worked machines were not invented by any of the "Ring," nor are they under the control of it; but they, nevertheless, exist, and in due time the public will have the benefit of their use.

I hazard the prediction that with these simple, reliable and inexpensive, but yet rapid perforators, and by a greatly improved system of recording in lines and pages, the public will, ere five years, perforate and translate their own messages, and thus be able to communicate ordinary business letters by wire, between all parts of the country, for 25 cents or less.

D. H. CRAIG.

Origin of the Telegraphic Signal "O. K."

78 and 80 BROADWAY,
NEW YORK, July 20th.

TO THE EDITOR OF THE TELEGRAPHER.

THE initials or letters "O. K.," employed as a signal in telegraphic practice, were derived from the political campaign of 1840, when the words "Oll Korreck"—represented by "O. K."—were in universal use in speeches and in the press.

In 1844 the experimental line between Baltimore and Washington commenced its career with the campaign of that year, particularly with the nomination of Polk by the Convention then sitting at Baltimore. The line had been working but a few days, and the nomination of Polk—then an obscure politician of Tennessee—was received in Washington with doubt, but in due time the mail confirmed the news given by telegraph, and then people began to think there was no trick about the telegraph. The letters "O. K." were used in that campaign as they were employed in 1840.

As a response to the reception of a message Morse employed the letters "I, I," but the everyday slang, "O. K.," used on all occasions, was readily employed by the telegrapher. Besides, the letters "O. K." are more distinct, telegraphically, than "I, I," for signals. Though in use from the commencement of the telegraph as a signal, they were officially adopted by the Telegraphic Convention at Washington in 1853.

TAL. P. SHAFNER.

M. TOMMASI, inventor of the hydro-electric cable, a device by means of which signals are transmitted through fine tubes filled with water, has lately succeeded in sending ten signals per second over a distance of two miles and a half. A full description, with illustrations of the invention, is contained in the *Science Record* for 1872.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, JULY 25, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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38 VESEY ST., New York.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

The Western Union Official Organ and Duplex Telegraphic Inventions.

In its issue of the 15th instant the *Journal of the Telegraph* is moved by the remarks of our correspondent, ONTARIO, which appeared in our paper of the 4th inst., to attempt a retort upon THE TELEGRAPHER. ONTARIO, in the communication referred to, briefly exposed the absurdity of the attempts made through the *Journal* to claim everything of value in connection with duplex telegraphic inventions for Mr. J. B. STEARNS (whose duplex patents have been purchased by the Western Union Company). Characteristically, no pretence even was made of showing that our correspondent was incorrect in his statements in regard to the particular device referred to; but, smarting under the exposure of the ignorance exhibited in that quarter of what actually belongs to Mr. STEARNS, in claiming for him a device described in his patent of 1868, and expressly disclaimed by him as belonging to Messrs. SIEMENS & HALSKE, of Berlin, an effort is made to ridicule a system of duplex telegraphy described and illustrated in the same issue of THE TELEGRAPHER. It is assumed by this erudite editorial writer that this plan is sanctioned by what he is pleased to term the "scientific editor" of this paper, when it is expressly stated in the first paragraph of that description, by the author, whose real name and address is attached to the article, that it is submitted for criticism or improvement. This disingenuousness is evidence either of ignorance and stupidity or of intentional unfairness. We have neither endorsed or otherwise the plan of Mr. BEAR, and have had no occasion to do either.

It may be that the editorial writer is unable to comprehend the fact that THE TELEGRAPHER and the *Journal of the Telegraph* are conducted on diametrically opposite principles. One is an independent telegraphic journal, while the other is conceded to be merely the organ of the Western Union Telegraph Company. The columns of THE TELEGRAPHER are open to the presentation of the views and inventions of all respectable telegraphers and telegraphic inventors, whether they are regarded as sound or valuable in official and editorial circles or otherwise. We are by no means so inflated with the idea of our own acquirements, knowledge and ability, as to flatter ourselves with the belief that all telegraphic and editorial wisdom

and knowledge centre in the editorial chair or chairs of THE TELEGRAPHER. We regard it as possible that some original ideas may be presented by others worthy of consideration and space in our columns.

The *Journal* is conducted strictly as an organ, and it is intended that nothing shall appear in its columns which does not inure, or is not intended to inure directly to the interests of the Western Union Company, or of its leading officials. In the design to advance these interests, inventions and scientific discoveries and principles are either ignored or contemned in its columns, as may seem most practicable or advisable. We have no telegraphic axes to grind, and are not, therefore, under the necessity of disparaging or ridiculing at one time what subsequently are extolled as most wonderful inventions, merely because in the meantime it has become our interest to do so. This is the difference between an independent telegraphic journal and an organ.

In whatever receives our editorial endorsement, either in practical telegraphy or electrical science, we seek to be first of all correct; and that we have been careful in this respect is shown in that we have never been obliged to retract or change our position on any important points. We do not jump at conclusions, or sustain at one time what we are subsequently obliged to oppose or condemn. THE TELEGRAPHER being the acknowledged authority in electrical and telegraphic science and art in this country, we cannot afford to prostitute its columns because our interests may appear to lie in a certain direction. We do not ignore facts merely because they fail to coincide with theories, and make the paper ridiculous by praising and extolling at one time what we have before condemned and denounced—not on account of any new light upon the subject, but because in the meantime the proprietorship of certain patents has changed hands.

The readers of THE TELEGRAPHER are well aware that it has always awarded to Mr. STEARNS the fullest credit for all that he has done towards the advancement of duplex telegraphy. As president of a telegraphic organization his opportunities for introducing the system into practical use were unusually favorable, and what is more important, he possessed the knowledge, ability and enterprise to avail himself of these opportunities. Had it not been for Mr. STEARNS the duplex would to-day unquestionably occupy the same position, in public and professional estimation, that it did for twenty years previous to its introduction by him on the Franklin line in 1868—that of a mere scientific toy, of no practical value. Mr. STEARNS persevered, in spite of opposition and ridicule, until he had established the fact that the duplex system was just as practicable for through circuits of ordinary length as the Morse system itself. Some four years after the time when the duplex first began to be employed in every day service, an attempt was made to work it on a 500 mile circuit between New York and Buffalo. A somewhat unexpected embarrassment was experienced from the effects of static induction, which Mr. STEARNS soon surmounted by the ingenious and beautiful device of applying a compensating condenser. The credit of this latter invention unquestionably belongs solely to Mr. STEARNS, although several unsuccessful efforts have been put forth in certain English journals to deprive him of it. What our correspondent referred to was the evident attempt on the part of the *Journal of the Telegraph* to claim in behalf of Mr. STEARNS a great deal more than he actually invented, and, in fact, much more than he ever claimed for himself. It, however, sees fit to say:

"We here beg leave to remark that thus far Mr. Joseph B. Stearns is the first and only man who has invented and put in operation a successful system of duplex telegraphy. We are not unmindful of the great efforts put forth in this direction by Gintl, Siemens, Frischen, Newhall, Hughes, Farmer and other distinguished electricians and inventors. But as Mr. Stearns was the first, and thus far the only person to practically solve this great problem, we have thought it no more than his due to accord him his just claims."

As the *Journal's* editorial writer seems disposed to

make a point on this matter, will he please inform us if there is any device, or combination of devices (other than the condenser) to be found in the differential duplex, as now or heretofore used on the Western Union lines, and which is in any degree essential to the successful daily operation of the instrument in practical business, which was not known or used by others prior to the introduction of the apparatus of Mr. STEARNS in 1868, and if so, will he be so kind as to specify the same?

If by saying that Mr. STEARNS was the first to practically solve this great problem, the *Journal* means that he was the first to employ the duplex for regular telegraphic service, we will not dispute the assertion, although Dr. SCHELLEN in his work (edition of 1867) gives an elaborate description, with engravings, of a duplex (gegensprechen), which he states was then regularly working between Amsterdam and Rotterdam, in Holland. But if, on the contrary, he means it to be understood that Mr. STEARNS was the first and only inventor of a successful system of duplex telegraphy, and that the essential elements of such a system are covered by the patents now owned by the Western Union Company, we think the assumption is open to question.

Automatic Telegraphic Inventions.

In an article published in *The Tribune* of Tuesday, the 14th inst., to which a brief reference was made in the last number of THE TELEGRAPHER, it was stated that THOS. A. EDISON'S claims to certain inventions in connection with automatic telegraphy were undisputed. This statement provoked the following communications, which appeared in the *Tribune* of Saturday last, and which indicate that the *Tribune's* informant had grossly deceived that paper in regard to the claims of EDISON to the inventions referred to:

A CLAIM OF PRIOR INVENTION.—MAGNETIC INDUCTIVE COMPENSATION SAID TO BE IMPRACTICABLE.

To the Editor of the Tribune.

SIR: Will you do me the justice to submit the following reply to an article on the automatic system of telegraphy which appeared in your issue of yesterday? In reference thereto allow me to say that the principle of inductive compensation for lines of telegraph is public property, and covered by English patents upwards of twenty years old, and abandoned for the following reason: That it was found impracticable, and is physically impossible to neutralize a flowing or galvanic current of low tension on long lines by an induced magnetic current of high tension. Allow me to inform your subscribers that I was the first to use, in November, 1868, in New York, in the presence of Mayor Medill of Chicago, the late Geo. B. Hicks, of the Associated Press at Cleveland, Gen. Marshall Lefferts, and several other gentlemen of scientific attainments, a series of inductive relay magnets and rheostats at the end of an automatic line. But were it necessary to use inductive compensation as a substitute for the condenser, the effects could be produced with properly constructed coils or helices; but it is not at all requisite, if the lines be properly constructed by the free use of iron poles in good damp connection with the earth, or by the free use of the English and German pole wires to earth, in connection with an overflow dam, and any suitable form of accumulator at the receiving end of the line.

The coils or helices surrounding the iron cores perform the functions of a condenser or accumulator as well as the office of an "overflow dam rheostat." To each of which, in combination with an automatic chemical telegraph, I hold a broad claim by virtue of some seventy patents throughout the world.

Finally, the use of coils in any form at the receiving end of a line of automatic telegraph, so as to allow of an overflow of the line current to earth, or, as I term the same, an overflow dam, cannot be used without an infringement on my "American Automatic Telegraph System," patented.
GEO. LITTLE, C. E.
Passaic City, New Jersey, U. S. A., July 15, 1874.

To the Editor of the Tribune.

SIR: In the article on "Improved Telegraphy," in the *Tribune* of Tuesday last, describing "the automatic system," there are some statements which were made under a misapprehension of facts. It is stated that two difficulties prevented for some time the success of automatic telegraphy, viz: The want of means for punching the characters rapidly, and "the existence of what is called the 'after current,' in consequence of which a dragged line was produced on

the prepared paper, instead of clear dots and dashes;" that Mr. Edison "overcame the difficulty by placing a magnet at each end of the line, in such a position that it sends a counter current into the wire, which neutralizes the after current." You add: "The claim of Mr. Edison to be considered its sole inventor is undisputed. In the words of George B. Prescott, "Mr. Edison in this respect stands above all the electricians in the world. Mr. Edison also invented the perforating machine used by the Automatic Telegraph." As to the latter assertion, I beg leave to state that my brother, Frederick J. Grace, is the inventor of the perforating machine in question, and that there is now pending in the Patent Office an "interference" case to determine the validity of his claim, in which I am interested. As to the assertion that it is "undisputed" that Mr. Edison is the inventor of the device referred to for "neutralizing the after current," I have only to state that it is well known that Mr. Edison's claim to that invention is and always has been from the very first disputed by me. I used the magnets at each end of the line, for the purpose described, long before Mr. Edison had anything to do with automatic telegraphy.

GEORGE H. GRACE.

New York, July 16, 1874.

Telegraphic Inventions and Inventors and The Telegrapher.

THE usual midsummer dullness in telegraphic matters has been suddenly dispelled, and our columns are availed of to discuss the matters of interest to the telegraphic fraternity impartially. As THE TELEGRAPHER is not an "organ," its columns are freely open to those who may have anything to present of interest telegraphically. The attempt which has been made in certain quarters to claim for a person not entitled thereto certain telegraphic inventions, has stirred up others interested to vindicate their rights in the premises, and are not likely to prove very advantageous to the individual referred to, or those who are backing him in his efforts to appropriate the discoveries and inventions which justly belong to others. Certain skilfully concocted schemes, from which much advantage was anticipated, have been badly damaged and demoralized already, and are likely to prove abortive and fruitless. THE TELEGRAPHER will always be found on the side of right and justice in such cases, and, so far as we can prevent it, no charlatan or unprincipled appropriator of other's property and rights, in connection with electrical and telegraphic inventions, shall meet with success. This matter is not by any means yet ended, and our readers may expect that for some time to come our columns will be enlivened by the ventilation of these matters.

Personals.

Mr. CLIF. E. MAYNE, of the Chicago, Quincy and Burlington Railroad, at Cromwell, Iowa, has retired from telegraphy to engage in other business.

Mr. H. GARNER has been transferred from Tunnel No. 3, on the C. and N. W. R. R., to the train despatcher's office of the same road at Baraboo, Wis.

Messrs. STEVENS, AMSDON and AVERY, of the Chicago Western Union day force, who have been absent on vacations, have returned, looking very much refreshed and invigorated thereby.

Mr. ROGER B. PEARSON, formerly Superintendent Western Division Pacific and Atlantic Telegraph Company, has resigned his position on the Western Union day force at Chicago, Ill., to accept the position of General Manager American District Telegraph Company, same city.

Mr. F. W. CUSHING, formerly night report operator, Northwestern Telegraph Company, St. Paul, Minn., is "subbing it" for Mr. DELANO, of the Western Union Chicago day force, the latter having taken a vacation.

Mr. H. H. HUNT, one of the "old stand bys," formerly of the Western Union Chicago force, but who has been for some time past devoting his time to paper manufacture, has returned to Chicago and is now "subbing" it for the W. U. Co. there.

Mrs. W. H. LOUDERBACK, of the Western Union Chicago day force, is absent on a vacation.

Miss LILLIE SMETHELLE, of Metropolitan Chicago day force, fills Mrs. LOUDERBACK's place quite acceptably—Miss SMETHELLE's place being filled by one of PORTER's college graduates.

Mr. W. H. LOUDERBACK, of "Qu." Philadelphia fame, has been appointed a receiver in the Western Union main office, Chicago.

Mr. HAZLETINE, formerly manager McGregor, Iowa, Northwestern Telegraph Co.'s office, but more recently manager of Lacrosse, Wis., office of the same company, has resigned on account of the work being too arduous, and is now "subbing" for the same company in Milwaukee, Wis.

Mr. MARTIN RYAN, an old experienced telegraph manager and superintendent in Canada, who, some two years since, worked on the W. U. night force, Chicago, is now actuary of the Protection Life Insurance Company of Chicago, one of the rising institutions of the northwest. Besides this, he sits in the editorial chair of the *Advocate*, printed by the same company, and is one of the Board of Directors and a member of the Executive Committee. What MARTIN don't know about insurance ain't worth knowing.

Mr. J. B. NUGENT has resigned the position of operator at Langdon, Pa., on the Philadelphia and Erie Railroad, and has accepted the situation of agent with the Pittsburg and Connellsville Railroad at Bridgeport, Bedford County, Pa.

The Telegraph.

The Cable Steamers.

THE cable steamers Faraday and Ambassador left Halifax on Wednesday last for Torbay, N. S., to commence laying the cable from that point to the Newfoundland coast.

Telegraphic Communication Between the Courts and Lawyers' Offices.

AT a special meeting of the Board of Aldermen of this city, held last Tuesday afternoon, a petition from the New York Law Telegraph Company was presented by Alderman Billings, asking for permission to place their instruments in the Register's office and the various court rooms in the Court House. After the petition had been read a resolution was offered by Alderman Billings to give the company the permission requested. He said a subscription list had been opened by lawyers, who wished to have telegraphic communication between the courts and their law offices.

After some discussion the resolution was adopted by a vote of 8 in favor to 3 against it.

Landing of the Shore End of the New Atlantic Cable.—Scenes and Incidents.

THE following interesting account of the landing of the shore end of the new Atlantic telegraph cable is taken from a special despatch to the *New York Times*:

PORTSMOUTH, N. H., July 15.

The shore line of the direct Atlantic cable is laid, and the end now lies embedded in a flat and desolate field at Straw's Point. The landing was made last night in the presence and with the assistance of a large assemblage of ladies and gentlemen. The Ambassador anchored yesterday afternoon about three quarters of a mile off the Point, and the cable boats were stationed at her stern for the reception of the shore end of the cable. It is a powerful wire, two and three eighths of an inch in diameter, weighing seventeen tons to the mile, and wound with powerful steel wires. The wire was passed over the wheels from the tank and pulled by seamen with the boats, being laid in coils from the outside toward the centre.

At 1.45 o'clock in the morning these boats started for the shore, the distance from the ship to the beach having been previously accurately measured by instruments. At nine o'clock in the evening a line was attached to a strong rope, which was made fast on the shore and drawn taut on the ship. The cable from the boats was paid out slowly, and kept taut by strong pressure from a beam pressed upon the wire, which acted as a lever as it passed out. The Faraday launch preceded the other boats, steaming along the rope connecting with the shore. Two cutters followed, each containing a crowd of cable hands, who had hauled on the ropes and drew the last boat containing the cable in a direct line to the shore. The night was rather dark, and the procession of boats, lighted by solitary lanterns, presented a gloomy appearance, while the stillness was broken by the "Heave ho" of the cable hands, and the wild, uncouth songs with which they accompanied their clock-like motions as they worked along the ropes.

One hundred salutes were fired from the shore, and volley after volley rolled and echoed over the waves as the cable neared the land. The Captain's gig accompanied the line, now directing the motions of the launch in port, and again falling to the rear, where the huge cable could be seen leaving the boats by jerks, as if unwillingly, and lighting up the water to the bottom

with the phosphoric light excited by its motion. When the boats arrived on shore a large assemblage was in waiting, and the advent of the cable was greeted with cheers and volleys. A trench had been dug to the life boat house on the beach, and the powerful wire was laid down in this, being hauled up the beach by officers, friends, reporters, townspeople, and, in fact, everybody, including ladies. From 3 to 4.30 A. M. the work of hauling up the cable was continued, and the splice to the already buried end completed. After the work was completed the boats for the Ambassador returned.

Next came the work of splicing. The outer and protective coat of wires, twelve in number, and each composed of two wires wound together, were first unwound from each section of the cable, then a deep winding of tarred and prepared oakum, which exposed another roll of eleven wires, was unwound. Beneath these is another winding of oakum, which covers a solid gutta percha case of three layers, enclosing the main conducting wire of seven strands of very fine copper wire. When the wire was laid bare at the end of each section, the gutta percha being cut away about two inches, each wire was filed down so as to shape them for jointing. They were then laid together, and wound with extreme care with fine copper thread, and over this melted gutta percha was carefully dropped and rolled. The successive covers were then wound and connected, care being taken to avoid more than one covering at the same point. The work was completed at 6:30 o'clock. The tale of the delay of the Ambassador is a repetition of that given concerning the long trip of the Faraday. It was caused by fogs and nothing more. The steamer started on the 3d of July, struck a fog immediately, and remained in it two days. On the 11th they passed a wreck, which they feared might be the ill fated Faraday, but a nearer inspection proved these fears false. Passing the spot where the Atlantic was wrecked was another fearful reminder of the horrors which they had been taught to expect, but still no wrecked Faraday could be seen. After putting in at Halifax the Ambassador proceeded to Torbay, which is described as a wild, desolate country, like the other Torbay from which it takes its name, and there the news was received that the Faraday was in Portsmouth.

Telegraphic and Electrical Brevities.

THE Manhattan Telegraph Company's submarine cable was cut at the east side of Blackwell's Island on Tuesday night, last week, and the cable pulled ashore at Ravenswood, L. I. The heavy chains that secured it were cut, and the cable was sawed into short pieces and taken away in a boat.

Mr. G. E. Smith, who erected for the late Professor Morse the first line of telegraph poles in this country—that between Washington and Baltimore in 1844—died a few years since at his residence in Newfield, Maine.

Foreign Telegraphic Notes.

TELEGRAPHIC communication between San Salvador and Guatemala, C. A., has been established.

It is proposed to lay a telegraphic cable from Port Limon, Costa Rica, to Aspinwall, with land lines to connect with Nicaragua, San Salvador and Guatemala.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JULY.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
16	71½ ... 71¾	.....	.....
17	71½ ... 72¾	.....	.....
18	72¾ ... 72¾	.....	.....
20	71½ ... 72¾	15 ... 15	.....
21	71½ ... 71¾	15 ... 15	.....
22	71½ ... 71¾	.....	.....

Married.

TAYLOR—HALL.—At Oakland, Oregon, July 7, 1874, Mr. G. A. TAYLOR, agent and operator of the Oregon and California Railroad, to Miss JENNIE HALL, both of Oakland.

Another tailor's "goose" is elevated! "Gad! my son, take my blessing. May you be happy and prosperous." Allow me to gently intimate that this is the best haul you ever made, and we hope your establishment may, in due time, have a full force of little tailors. WEBFOOT.

P. S.—Two more will clear out the bachelors on the O. & C. Railroad telegraph line.

PLUM—HUSTED.—At St. John's Episcopal Church, Cuyahoga Falls, Ohio, June 25, by Rev. T. B. Fairchild, Mr. H. W. PLUM, assistant chief operator of the Western Union Chicago, Ill., main office, to Miss Carrie E. HUSTED, of the former place.

May the lines of this young couple be cast in pleasant places.

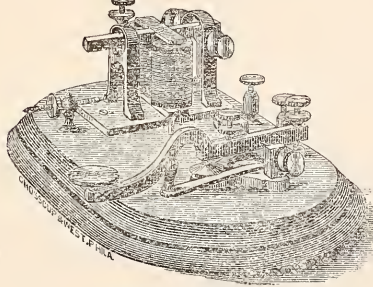
may there be no breaks or crosses in their current of domestic bliss; may their company through life be uninterrupted by reversed fortunes, and no ground cut off the pleasant communication so auspiciously established; but may they stand *plum* together until the good manager above relieves them, is the wish of

Born.

THORNTON.—To Mr. H. B. THORNTON, manager of the Northwestern Telegraph Company's office at Winona, Minn., a son—ten pounder—first edition.

WILLIAM BROWNLEE,
Dealer in
CEDAR TELEGRAPH POLES.
OFFICE FOOT OF LIBERTY STREET,
DETROIT, MICHIGAN.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,
WAVERLY HEIGHTS, PENNSYLVANIA.
PEERLESS.



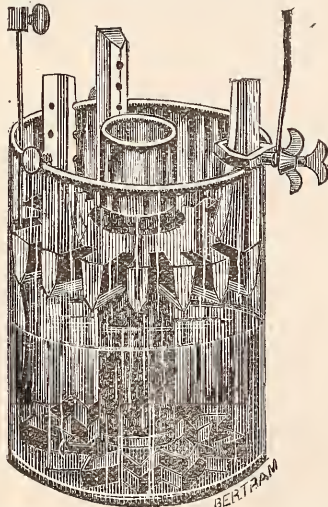
Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50
If money be sent in advance by registered letter. 12 00
Instruments without Battery. 11 50
Telegraphic and Electrical goods of every description at manufacturers' lowest prices.
SEND FOR CIRCULAR.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE

OUR ILLUSTRATED CATALOGUE NOW READY.

TO ELECTRICIANS AND INVENTORS.

OFFICE OF THE UNION ELECTRO-MOTOR CO., }
62 BROADWAY, NEW YORK, July 8, 1874. }

The attention of Electricians and Inventors is invited to the following proposition: The

UNION ELECTRO-MOTOR COMPANY

Desire to procure a

GALVANIC BATTERY

Fulfilling the following requirements:

1. It must be capable of maintaining a steady current of 6 farads per second through a resistance, external to the battery, of two tenths of an ohm, with not more than six pairs of plates. This is, approximately, equal to the current developed by 3 of Chester's No. 2 carbon cells, charged with mixed nitric and sulphuric acid in the porous cells through 50 feet of No. 18 copper wire .049 inches diameter.
 2. It must be absolutely free from fumes, and from liability to leak or spill its contents under any ordinary circumstances. If possible, it is desirable that a battery should be provided to work without liquids—in other words, a dry battery.
 3. It must be capable of standing for a considerable length of time unused without material depreciation, and yet be ready to give out its full power at a moment's notice whenever required.
 4. It must be self-supplying to an extent which will render it capable of furnishing a current, as above stated, for not less than 300 hours in succession without renewal.
 5. Other things being equal, preference will be given to the battery occupying the smallest space.
- For the best battery fulfilling the requirements herein specified a premium of

FIVE HUNDRED DOLLARS

will be paid, in accordance with the decision of the judges, if the battery is adopted by the company—which shall also have the privilege of exclusive ownership by paying the additional sum of

FIFTEEN HUNDRED DOLLARS.

This offer will remain open until November 1, 1874.

Judges.—MARSHALL LEFFERTS, President of the Gold and Stock Telegraph Company; GEORGE B. PRESCOTT, Electrician of the Western Union Telegraph Company, and FRANK L. POPE, Electrician.

E. B. GRANT, President.

H. H. DUNCKLEE, Secretary.

THE "SNAPPER" SOUNDER.



TRADE MARK. PATENTED MAY 12, 1874.

POLISHED, 30c., OR 6 FOR \$1.50.

POLISHED, WITH NICKEL-PLATED SPRING, 40c., OR 6 FOR \$1.80.

POLISHED, WITH KNOB AND SCREW FASTENINGS, 75c.

PRICE,  75 CENTS.

Sent post paid on receipt of price.

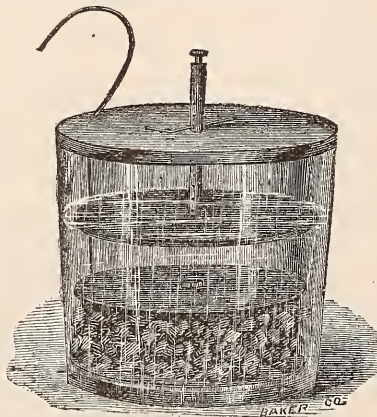
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BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cells. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

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Messrs. PARTRICK, BUNNELL & CO.

hereby announce to the telegraphic and electrical interests of all sections that they have established a

GENERAL TELEGRAPH AND ELECTRICAL SUPPLY DEPOT

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where they will keep in stock all styles of First Class Latest Improved

MORSE TELEGRAPH INSTRUMENTS,

SUPERIOR QUALITIES OF BATTERY MATERIAL

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AT LOWEST MARKET RATES.

The stock will include all our celebrated specialties in

CHAMPION LEARNERS' INSTRUMENTS,

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IMPROVED CURVED KEYS,

ELECTRIC BELLS, IN GREAT VARIETY,

NEW WESTERN UNION PIN SWITCHES, WITH IMPROVED

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LATEST AND BEST FORMS OF GRAVITY BATTERIES.

Together with LINE WIRE,

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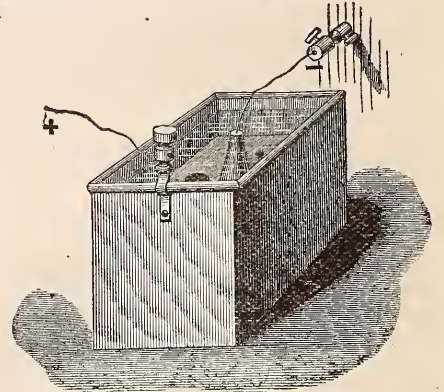
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A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

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PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

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Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

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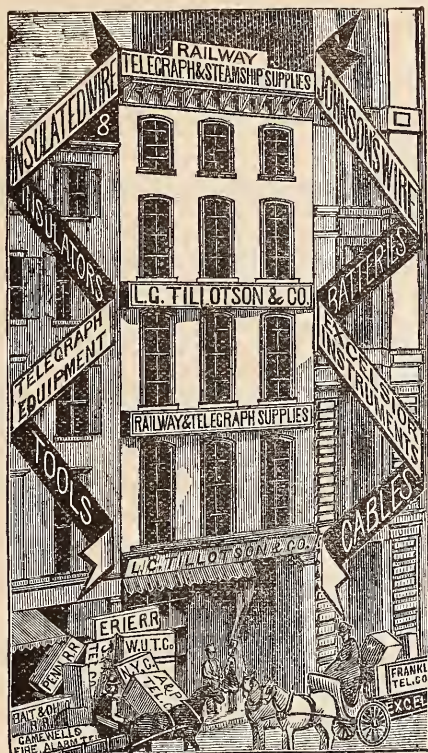
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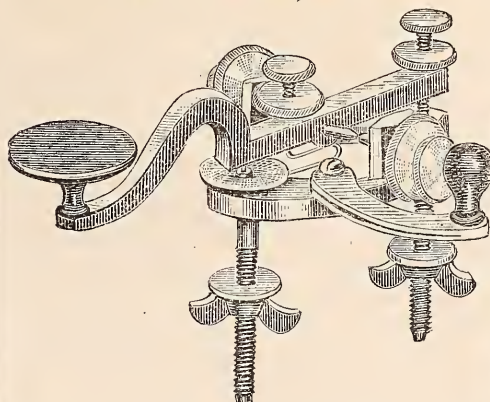
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Does not keep line closed by binding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out. Acknowledged to be a decided improvement. Price, same as the ordinary key. Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

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Omaha, Neb.,
Philadelphia, Pa.,
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Providence, R. I.,
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The Distinctive Features of these Systems of

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ARE,

First—The **Automatic Repeater**, through which the
apparatus may be distributed in a combination of circuits, and
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Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**,
adapted to produce the full tone of the largest church or tower
bells.

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for hose and engine houses, by means of which the location of
the fire is instantaneously communicated to the members of
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These Features combined form the

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FIRE ALARM TELEGRAPH

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It is a sufficient vindication of the claims which are made by
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POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of
practical use, and that the efforts which have been repeatedly
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to secure improvements, and the Systems are now covered by

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the introduction and operation of which involves so little ex-
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The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of
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AND THE

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throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POS-
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RELIABILITY and

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ABSOLUTELY PERFECT!

The amount of property which has been saved from destruc-
tion, and the number of lives which have been preserved
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CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for
any considerable length of time, they have been enormous, **THESE**
CAN BE NO QUESTION.

*The cooperation of TELEGRAPHERS in securing its in-
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their efforts will be duly appreciated and
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Any information desired in regard to the above
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EXCLUSIVE AGENTS OF

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

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We are now prepared to furnish, after an experience of three
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exposed to rain and sun, or to the vapor of acids, without injury.
Professor SILLIMAN, who has exposed it to the most destructive
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of the usual size, with KERITE COVER, believing that it will
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HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and
size of cable, which will be found to compete with any other
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now extensively used in this and other cities for private lines,
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We offer for sale, among other novelties, a **SOUNDER** that
will work practically with a single DANIELL cell, a **BATTERY**
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AND EVERY VARIETY OF
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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
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constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

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And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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This Instrument is offered to the public as the oldest, most rapid, and best.

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It has already been extensively adopted and has invariably given entire satisfaction.

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which is the best watchman's time recorder in the world. Also,
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EVERY DESCRIPTION,

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REGISTERS and KEYS.

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of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.

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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHEHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

Send for New Catalogue and Price List.

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THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"

"History of America," "Civil War in America;" Member

of many Scientific and Learned Societies of Europe

and America; Commander of the Order of Dan-

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Norway, and of the Sword Order,

Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, Housé, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

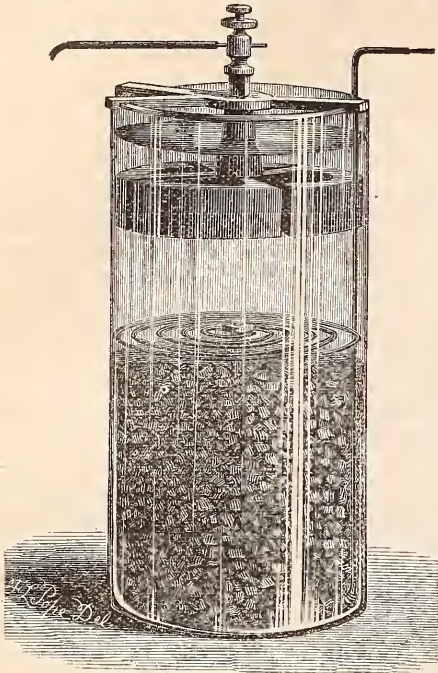
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
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No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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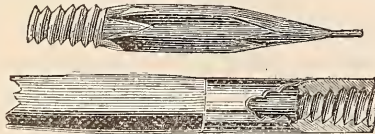
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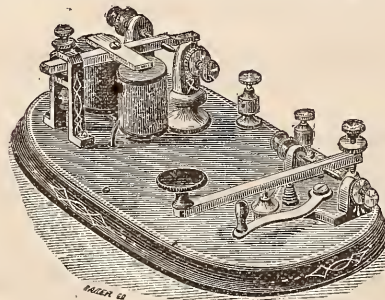
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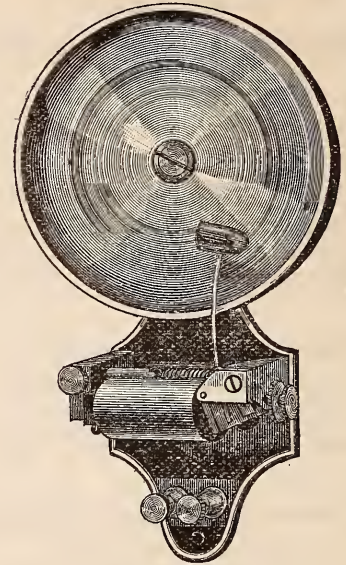
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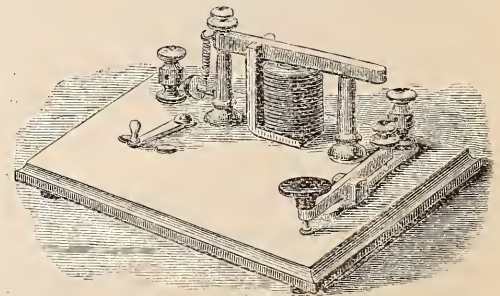
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A Journal of Electrical Progress.

Vol. X. New York, Saturday, August 1, 1874. Whole No. 420

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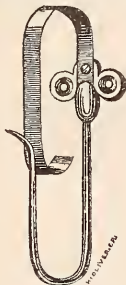
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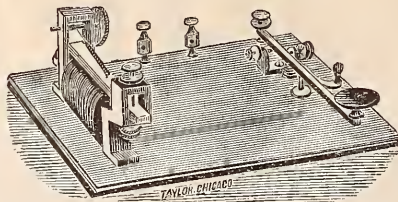
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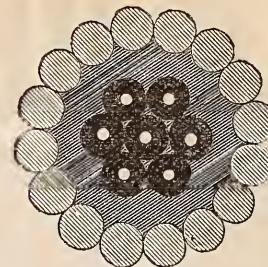
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, - - - - - PUBLISHER.

SATURDAY, AUGUST 1, 1874.

VOL. X.

WHOLE No. 420.

Original Articles.

Telegraphic Inventions—Old and New.

BY OLD TELEGRAPHER.

THE present excitement and discussion in telegraphic circles over what purport to be new telegraphic discoveries and inventions, will no doubt eventuate beneficially. This excitement and discussion has occurred at intervals from the time the first practical and successful line of electric telegraph was established. During that time important advances have been made in the telegraphic art, and the discoveries and developments in electrical science have brought telegraphy to a position and importance which could scarcely have been foreseen, or anticipated by those upon whom devolved its inception and demonstration as one of the principal factors in the problem of modern civilization.

The idea of instantaneous communication between distant points by means of the electric telegraph was so startling, and so contrary to the previous conceptions of other than a very limited number of persons, who had made the science and art a study, that their faith in it was regarded as a wild enthusiasm, and themselves as impracticable visionaries. Most of the readers of THE TELEGRAPHER are, to some extent, familiar with the difficulties and discouragements under which the inventors and promoters of electric telegraphy labored in the early days of the telegraph. Aside from the lack of faith in it which they had to encounter, and of adequate pecuniary means to demonstrate the practicability, importance and value of the system, little or nothing was known of the proper construction of telegraph lines, and the apparatus devised for electrical transmission of signals was crude and imperfect. But even under these disadvantages the results obtained were so wonderful, as then regarded, as to overcome, to a considerable extent, the objections and incredulity with which their project had been received, and the fact was soon recognized that a new element had been introduced, which must, at no distant day, to a considerable extent revolutionize modern society.

It is not the purpose of the writer to narrate in detail the progress of telegraphic invention and discovery. The story has been so often told that it has become trite and familiar. Besides, to treat it worthily and properly, would require more space than can be accorded in a single newspaper article. From the original Morse-Henry telegraph system to the Automatic telegraph of to-day, is a step almost as marked and wonderful as from the old semaphore telegraphs to the former. Step by step has the science and art progressed, until at the present time it is hazardous to predict what the limit of progress and development shall be. The electric telegraph now enters so intimately into all the details of business and social life that it is difficult for the present generation, who are so familiar with telegraphic facilities, to conceive how the world could ever have got along comfortably and satisfactorily without it. New uses and adaptations of it are constantly discovered and made, and so great have been its triumphs that the public eagerly accept any new claims and pretensions in that line almost without question or cavil. It is therefore hard to convince the majority of readers, when any pretensions of remarkable inventions are made, that they are not founded in fact, and that those who make them are not really entitled to the credit which they claim. It is capable of demonstration, however, that many such claims have no foundation, and that those who make them are really merely revamping old, and, in many cases, impracticable ideas and experiments, which have been tested and found mere scientific toys.

Hundreds of individuals have, during the last thirty to forty years, devoted much time, study and research in this direction, and have produced theories and even practical applications which have proved futile and impracticable in actual and constant use. Many of these have been forgotten and are unknown, except to the student and those who have familiarized themselves with the history of electrical science and telegraphic art. It is from these forgotten experiments that not a few of the recent so-called telegraphic inventions are derived by those who aspire to fame and pecuniary remuneration by their introduction.

THE TELEGRAPHER has recently ventilated one of these barefaced attempts to impose upon the leading telegraph company of this country, and upon the public a pretended invention and improvement, which, it was claimed, would at once quadruple the capacity of all telegraph lines whose owners were so fortunate as to secure the privilege of using it! It is not necessary for the writer to add to the exposé of this pretended invention (?) which has already appeared in these columns. That bubble has been pretty effectually pricked, and we shall, probably, hereafter hear little of this remarkable invention. The so-called inventor has a decided faculty of appropriating other people's ideas and inventions, new and old, and has yet to justify by original performance the genius and talent which in several instances he has succeeded in impressing others, who should be better informed, with the belief that he possesses.

When the writer first engaged in telegraphy the art had made considerable progress, and there were then in practical use the Morse, Bain and House telegraph systems. The Bain, or chemical system, has gone out of use except in so far as it is adapted to automatic telegraphy. The House printing telegraph has been succeeded by the combination printing telegraph, which combines the House and Hughes printers in an improved instrument, and is used to a very limited extent by the Western Union Company, who still hold some unexpired patents on it. The Hughes printer proper is quite extensively used in Europe, where Prof. Hughes has been more successful in securing its adoption than he was in this country. The Morse system, as is well known, is now, as it always has been, the one most extensively and generally used in this country, and it is likely to be some time yet before it is superseded by any other system. The only really important and valuable improvements which have recently been made has been the making practical the duplex telegraph in actual use, and the automatic telegraph, which is confidently believed by many to be the telegraph of the future. That practical automatic telegraphy is a comparatively new invention cannot be doubted. That it is destined, at no very distant day, to be developed and introduced extensively into practical use on the principal telegraphic routes, and that it will effect a marked change in telegraphic business, will hardly be questioned except by those who have interests which would be affected unfavorably thereby. While the writer is hardly prepared, as yet, to concede all that is claimed for it by its especially enthusiastic advocates and promoters, enough has already been demonstrated, even upon the limited scale upon which it has been tried, to show its great importance and value.

As usual, many persons have had, from the original conception of the idea of rapid automatic transmission, a part in its development to its present advanced state. It is not proposed to discuss here the claims of those who pretend to be inventors of automatic telegraphy. Here, again, the pretended inventor of the quadruplex telegraph comes prominently forward, and with as little real claim to the one as the other, although Mr. Prescott, the electrician at headquarters of the Western Union Telegraph Company in this city, recently informed the reporter of a daily paper that his claims were "undisputable;" a statement which indicates that that gentleman has not kept himself informed of current telegraphic history, or else allowed his zeal on behalf of his new friend and associate to outrun his regard for strict accuracy in his statements.

The automatic telegraph, as is the case with other systems in use, is undoubtedly the result of the research and inventions of many persons, which, combined, go to make up the system now in successful operation, so that no one individual can properly claim to be the inventor of the automatic telegraph system.

The establishment of long submarine telegraph lines rendered necessary a different description of apparatus for the transmission and communication of signals. The reflecting galvanometer supplied this necessity for the time, and rendered practicable the use of very light batteries upon such lines, without which it would have been impossible to maintain their insulation for any length of time. With the reflecting galvanometer and the transmitting apparatus employed, the transmission of telegraphic signals over long submarine lines has been necessarily comparatively slow. Efforts are now being made, and with indications of success, to develop improved systems of working, and apparatus which shall increase the capacity of such lines, and make it possible to record the signals. It is believed that ere long the application of the duplex arrangement to long submarine lines will be found practicable, and many intelligent, scientific and practical telegraphers are busily employed in devising other means for increasing the capacity of such lines. That success will eventually crown the efforts of one or more of them is probable. The necessity has generally resulted in producing the apparatus required to supply the want. With increased capacity the relative expense of cable telegraphy will be reduced, and cheaper rates for such service can be afforded, which is what the public

require to render the use of ocean telegraphs more general and popular.

Of the numerous telegraphic inventions for special uses, ingenious and valuable as many of them are, there is not time or space to treat in this article. With these the readers of THE TELEGRAPHER are tolerably familiar. Much skill, talent and inventive genius has been devoted to these specialties for several years past, and they have resulted in adapting the telegraph to many of the necessities and requirements of our busy and enterprising people. These inventions for special purposes have chiefly been made and put into practical use in this country, and thus far have not been adopted to any extent in Europe, where the people are slower in making changes and innovations upon established habits and customs. The reporting telegraphs, the various systems of fire alarm and burglar telegraphs, the District Telegraph System, etc., are essentially American inventions, and most of them are of comparatively recent date. They have met with prompt and cordial reception in this country, because they supply necessities and afford facilities which are recognized as being of great value and importance. New adaptations of electrical communication to popular use are constantly being made, and it is impossible to tell to what extent our requirements may eventually be supplied through the agency of electricity, of which we know in reality so little, further than that it pervades all creation, terrestrial and celestial, and without which existence would be impossible; and that while we can, to a certain extent, control and utilize it, yet it remains as much a mystery and wonder as ever.

To the intelligent telegrapher electricity affords a subject for study and investigation which can never become exhausted or uninteresting. Much as has been discovered and many as have been the telegraphic inventions and adaptations, the field seems to be practically limitless, and none need despair of opportunities in this direction. Much time and labor which is wasted may be saved by first obtaining information as far as it is attainable. Not only in telegraphy but in many other directions old devices are constantly being reinvented by those who do not take pains to inform themselves as to what has previously been done. This is frequently mortifying and discouraging, but may be avoided by previous investigation of the subject.

For the honest inventor and experimenter the writer has the fullest sympathy and earnest desire for success—for the impostor and charlatan, whether in telegraphic or other inventions, only contempt, and a desire that such may meet with the exposure merited. It is gratifying to know that for the latter THE TELEGRAPHER supplies a medium through which their fraud and pretensions may be shown up, while for the former it has encouragement and recognition. In this it is doing a good work, and proving its right to be considered a really independent scientific and telegraphic journal.

Financial Failure of the British Telegraph.

THE financial outlook of the British Telegraph under Government auspices and management is anything but encouraging. For a long time it has been impossible to obtain any adequate or comprehensive statement as to what the system cost the British Treasury in the outset, or what have been the annual expenditures for construction, maintenance and working, inquiries in this direction having been generally met with the response that it was not yet possible to separate capital from expenditure, and that, therefore, the public must be content with knowing that messages were transmitted at the rate of a shilling for twenty words, no matter whether the distance traversed was half a mile or five hundred. At last, however, we are in possession of information that enables us to discern something definite concerning the actual situation.

When the purchase and State control of the Telegraph was first brought before Parliament, the estimate of cost, founded on the judgment of experts, was £2,200,000, or \$11,000,000. When the business, however, had been assumed by the State, it was found that the Government had in reality bound itself to a much greater expenditure, and that the actual cost would not be less than £7,500,000, or \$37,000,000. This was about all the information that Parliament or its committees could get until Sir Lyon Playfair came in as Postmaster General and successor to Mr. Mousell, in the last days of the Gladstone administration. This new official, being of an eminently practical turn of mind, and withal taking warning, perhaps, by the fate of his predecessor, who retired under a cloud for allowing Mr. Scudamore, the Telegraph Superintendent, to expend some four millions of dollars without the authority or knowledge of Parliament, determined to know accurately what there was to be known, and as the result of such determination we have before us a British Treasury document bearing date March, 1874, which brings up the account of the telegraph to the 1st day of January, 1873, the latest date for which Parliament or the Treasury has any exact returns—a

fact in itself not a little singular and suggestive. The figures tabulated are as follows:

Capital Account.....	£8,667,800 or	\$43,339,000
Gross Receipts, less amount paid to submarine telegraph companies.....	970,083 or	4,850,415
Expenditures in respect to Salaries, Rents and Maintenance.....	825,275 or	4,126,275
Balance applicable for Interest and Sinking Fund.....	144,808 or	724,040
Annual Charge for Interest, Jan. 5, 1873.....	258,390 or	1,291,950
Deficiency of Telegraph Revenue to meet Interest on Telegraph Stock, for year ending Dec. 31, 1872.....	113,583 or	567,915

In other words, the financial result of the British Telegraph under State management up to the commencement of 1873, showed a deficiency of receipts adequate to meet expenses and interest (the latter calculated at three per cent., the rate on consols, by which the capital is represented) of nearly six hundred thousand dollars. Had five per cent. been paid—the lowest rate at which the United States has been able to borrow, and a lower rate than France or the best railroad corporation in the United States can obtain—the deficit would have increased to nearly one million five hundred thousand dollars.

It is also to be observed that the capital account of the British Government Telegraph is not yet closed, but a further addition, on account of arrearages, of at least \$10,000,000 is anticipated. At the same time, many of the expenses actually incurred in the management of the telegraph are charged to the account of the Post-office, and so go to swell the cost of the Mail Department of the Post-office, and diminish that of the Telegraph Department. For example, the telegraph manager receives a salary from the Telegraph Bureau of £300, and another from the Post-office of £1,500, although his duties are exclusively telegraphic. In a similar way many of the extensions and alterations of buildings to accommodate the telegraph are charged upon the Post-office. In short, the whole showing is a most singular one, not at all creditable to official management.—*New York Tribune.*

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS NOS. 63, 64 AND 65, UP TO AND INCLUDING

JULY 25TH, 1874.

- 5, 13, 25, 26, 28, 46, 54, 59, 60, 61, 67, 72, 75, 82, 89, 101, 103, 108, 113, 114, 129, 134, 136, 139, 140, 146, 148, 228, 235, 240, 244, 247, 257, 267, 278, 279, 281, 282, 283, 285, 312, 319, 323, 328, 350, 351, 367, 371, 376, 378, 380, 381, 391, 392, 393, 402, 405, 406, 413, 425, 441, 456, 463, 516, 520, 533, 548, 553, 554, 565, 575, 577, 579, 584, 604, 622, 648, 656, 672, 678, 680, 685, 690, 701, 708, 729, 734, 735, 741, 769, 787, 791, 801, 803, 809, 820, 848, 883, 886, 915, 927, 930, 931, 939, 943, 978, 980, 995, 998, 1000, 1002, 1005, 1013, 1047, 1055, 1058, 1061, 1080, 1085, 1093, 1099, 1102, 1148, 1149, 1152, 1154, 1191, 1193, 1194, 1196, 1226, 1227, 1233, 1241, 1245, 1251, 1255, 1266, 1276, 1307, 1308, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1318, 1319, 1320, 1321, 1322, 1325, 1339, 1340, 1342, 1344, 1346, 1348, 1349, 1350, 1351, 1352, 1359, 1366, 1368, 1372, 1385, 1389, 1390, 1391, 1407, 1412, 1415, 1427, 1437, 1438, 1448, 1451, 1454, 1455, 1456, 1457, 1458, 1481, 1482, 1500, 1501, 1502, 1503, 1506, 1507, 1513, 1515, 1522, 1524, 1550, 1554, 1555, 1560, 1564, 1568, 1569, 1570, 1572, 1573, 1580, 1586, 1589, 1591, 1593, 1594, 1615, 1620, 1625, 1634, 1635, 1656, 1666, 1676, 1681, 1695, 1708, 1723, 1729, 1736, 1737, 1773, 1775, 1785, 1794, 1795, 1796, 1797, 1804, 1809, 1817, 1823, 1824, 1827, 1852, 1869, 1874, 1881, 1911, 1913, 1914, 1915, 1916, 1942, 1943, 1951, 1957, 1969, 1970, 1999, 2006, 2001, 2021, 2025, 2028, 2029, 2038, 2050, 2057, 2060, 2065, 2083, 2086, 2097, 2103, 2113, 2114, 2119, 2123, 2125, 2134, 2137, 2138, 2142, 2143, 2145, 2147, 2154, 2162, 2169, 2172, 2178, 2187, 2191, 2192, 2195, 2196, 2212, 2213, 2216, 2218, 2219, 2221, 2223, 2224, 2233, 2236, 2237, 2238, 2239, 2242, 2250, 2252, 2253.

ASSESSMENTS NOS. 63 AND 64.

- 255, 344, 361, 1205, 1742, 2040, 2181.

ASSESSMENT NO. 62.

- 27, 143, 238, 242, 246, 258, 381, 398, 451, 453, 455, 457, 790, 804, 1153, 1450, 1502, 1563, 1715, 1716, 1731, 1786, 1933, 1939, 1941, 1974, 1975, 1976, 2037, 2163, 2177.

The Eastern Telegraph Company.

AT the fourth ordinary general meeting of the Eastern Telegraph Company, which was held at the Cannon street Hotel, London, on Tuesday, July 14th, the chairman, John Pender, Esq., M. P., made some statements of the experience of that company from a reduction of its Indian tariff, which are of interest.

The Chairman said that "the revenue for the half year

showed the small increase of £1,676 as compared with the corresponding half of the previous year. The reason why such a small increase only had been made was comparatively simple: the Indian tariff was reduced, but there had not been that increase in traffic which they might naturally look for. On the other hand, the amount which had been lost on the Indian system had been recouped to a certain extent by the opening of new lines, and, therefore, the slight increase which he had mentioned was shown. No doubt the reduction of tariff would, in the end, bring an increase of traffic. What he might call the social traffic in India had not been developed to the extent he anticipated. During the last six months, also, they had had a good deal of extra expense in working the direct cable; they had been working the greater part of that time with one cable, and the other under repair. There had also been somewhere about £300,000 worth of the cable positively lying dead for about six months—namely, the Levant system. In consequence of some misunderstanding with the Egyptian Government the company was prevented from landing its cable, but he was happy to say that this difficulty had been removed, and that portion of the line now came in as a feeder to the other sections. The Brazilian line was also opened the other day, and was working in a satisfactory way, and when the cable was repaired to Lisbon the company would have the full benefit of the additional traffic from that Brazilian line. The system, with the exception of one of the cables, was working satisfactorily, although it had not increased in the ratio which was anticipated; but there had been great depression of trade all over the world, and that might account for it to some extent. He, however, hoped they were about to see a better state of things, and that this company would participate in its advantages. In conclusion, the Chairman moved the adoption of the report and accounts, and the declaration of a dividend of 4s. per share, making, with the previous payment on account, a total dividend for the year of 6 per cent."

Sir James Anderson seconded the resolution.

In answer to Mr. Powell,

The Chairman said that the negotiations for a joint purse traffic arrangement with the Indo-European Telegraph Company were discontinued, owing to objections raised by the Governments from which the Indo-European Company held their concessions.

A discussion ensued, in which Lord Hawke, Mr. Ford, and other gentlemen took part, after which the resolution was put and carried.

Some formal business was then transacted, and the proceedings closed with a vote of thanks to the chairman and directors.

How to Find the Electro-motive Force of a Battery.

WE have been approached as to how a person should go to work about finding the electro-motive force of a battery. This question has puzzled several people, but to our mind it seems perfectly clear, that is to say, the fluid portion of the battery. Everybody knows, in fact most all of the little children in our neighborhood have been telling incessantly, as it were, that one vebel of electricity decomposes .00142 grains of water or develops .000158 grains of hydrogen. (Ah! hydrogen; how the word savors of good old times. If there's anything we do like it's hydrogen or Holland gin mixed.) Or 1721 C. C. mixed gas (but *ain't* mixed gas good; soda water), and all this at an O. C. and barometric pressure of 760 ^{mm}. As we observed before, everybody knows this, but how to *work* it out? Ah! "that's the question: whether it's better to suffer the Bradley that we have, or fly to Culley's that we know not of, must give us awful pause" for a few days. But to resume: electricity decomposes hydrogen. The solar orb decomposes dogs, cattle and other business. The proper way is to make a proportion of it thus: If the sun decomposes 16.91 square inches of dog, allowing .21 for resistance of the hair, in 41568 hundredth thousandth of a second by Higdon's new watch, and electricity decomposes .00142 hundredth thousandths grains of water in the same time by the new gold watch Jot Spencer has—to get, how long will it take a Bradley galvanometer to measure the resistance of a Bologna sausage? Now, Newton, sail in and leave Jones and the Calland in the dim dis.—*The Plug.*

A Misstatement Corrected.

THE following letter from Hon. Ezra Cornell is published in the *Ithaca Journal*, and refers to an item in its telegraphic despatches. The inference in the last paragraph is incorrect, Hon. F. O. J. Smith being still living:

Editor's Journal.

I observe in your notice of the death of G. E. Smith the statement that he set up the first line of telegraph poles in the country, between Washington and Baltimore. I can inform you that there was no person by

the name of Smith connected with Prof. Morse, in any way, with the setting up of the first line of telegraph poles between Washington and Baltimore. Hon. F. O. J. Smith, of Portland, Me., had a contract from Prof. Morse for laying the pipe for the conductors for the telegraph between those two cities. He laid ten miles of the pipe, through the agency of the machine which I invented for that purpose, extending from Baltimore to the Relay House. At that point the work was tested, and the insulation was found to be insufficient, and the project of putting the pipe down was discontinued. This was in December, 1843. Here Mr. Smith's connection with the matter ceased. In April, 1844, Prof. Morse decided to put his wires on poles, placing the entire charge of the work, in all its departments, in my hands. The Smith you refer to as having died a few weeks ago in Maine may have been Hon. F. O. J. Smith, who would now be nearly seventy years of age. Yours respectfully, EZRA CORNELL."

An Improved Astatic Galvanometer.

IT is desirable, in many investigations in magnetism, to free a needle not only from the inductive action of the earth, but also from its directive influence. Prof. Trowbridge, of Harvard College, adopts the following method; An ordinary tangent galvanometer is so constructed that its coil is free to turn about a vertical axis and also about a horizontal one. The coil is first placed in a plane perpendicular to the magnetic meridian; it is then twined about its horizontal axis until the component of the strength of the current in the horizontal plane shall be just equal and opposite to the earth's magnetism. Under these conditions the needle is evidently in a state of unstable equilibrium, and if placed perpendicularly to the magnetic meridian, will vibrate through small arcs, free from the influence of the earth, and subject only to the attraction in the field of force in which it may be placed. A bar of soft iron placed in the vertical plane passing through the suspension of the needle perpendicular to the magnetic meridian, at a suitable distance from one of the poles, will bring it back to zero. This method constitutes, practically, a new astatic system.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

America.—Its Universal System of Rapid Automatic Telegraphy.

TO THE EDITOR OF THE TELEGRAPHER.

AS a citizen of the United States of America, I feel greatly exalted in having been made the chosen instrument (under the guidance of a great and mysteriously beneficent Providence) in the discovery and development of that enduring link in the chain of telegraphic invention which has made the telegraph a still greater marvel in the field of electrical science, and thereby rendered the same practically universal.

GEORGE LITTLE,
Passaic City, New Jersey, U. S. A.

(Extracts.)

* * * It is very important in my judgment, and in the judgment of Gen. Lefferts, that a certain gentleman should see your "automatic system." * * * D. H. CRAIG, to George Little, November 24, 1869.

* * * "Little's automatic telegraph process." * * * To my mind the experiments were very satisfactory. * * * Any desired length of circuit can be worked. * * * From my long practical knowledge of the wants of the press, and the defects of the Morse system of telegraphy, it seems to me that I cannot recommend the new system too strongly. GEORGE B. HICKS, General Agent of the Western Associated Press, Cleveland, Ohio, December, 1869.

* * * By the "Little's automatic system" the overwhelming advantages of this new fast system has been conclusively demonstrated on a telegraph line over two thousand miles long. * * * This fast system of sending messages by telegraph, invented by George Little, Esq., covers the entire system of automatic fast telegraphy. The distinguished scientific telegraphic expert, George B. Hicks, Esq., of Cleveland, Ohio, who, after more than a week's critical examination and testing, reported as per letters annexed. D. H. CRAIG, New York, December 1, 1869.

* * * We have before us a pamphlet of twenty-two pages on "Little's Automatic System of Fast Telegraphy." American editorials, 1869.

* * * By the terms of your communications of March 10th and 17th last, you accorded to me the space of six months, from the first of April ensuing, to

complete arrangements for the sale of your automatic telegraph patents for the United States. D. H. CRAIG, August 31, 1869.

Automatic telegraphy. * * * We claim for Mr. Little the whole credit of teaching us the truly wonderful and beautiful art of transferring the rapid signals upon paper. Other electricians had accomplished sixty or seventy words per minute over two or three hundred miles in length. But any attempt to transmit signals at a greater speed invariably ended in utter confusion of, or the mixing of the signals at the recording end of the line wire. But Mr. Little transmits and records accurately and reliably even fifteen hundred words (seven thousand five hundred flashes) per minute. * * * There is no evidence in or out of the writings of scientists that any electrician or telegrapher, before Mr. Little, ever succeeded in accurately and practically recording, at one end of a long wire, extremely rapid signals sent from the opposite end. And, just here, let me inform you, is the great and the only difficulty connected with automatic or fast telegraphy. D. H. CRAIG, June, 1872.

* * * But if you or any of your correspondents think proper to venture to assail any of my past statements as to the merits or capabilities of the "Little system of automatic telegraphy," I pledge myself to successfully explain the fallacy of the arguments which you or they may bring forward against the system. D. H. CRAIG, July, 1872.

* * * We now receive, day and night; * * * in fact, do anything you want done. Just received long and perfect message. * * * E. H. JOHNSON, Charleston, S. C., General Manager Automatic Telegraph Company, Oct. 26, 1872.

* * * Can do two hundred to two thousand words per minute from Charleston, S. C. HARRY BERTRAM, Manager Automatic Telegraph Company, Washington, November 27, 1872.

NEW YORK, Oct. 12, 1872.

The Hon. FRANK IVES SCUDAMORE, Chief of Postal Telegraph Dept., London England.

* * * My system of automatic telegraphy has been completed, and the instruments and appliances perfected for its successful inauguration. * * *

I am, sir, very respectfully,

Your obedient servant,

GEORGE LITTLE.

* * * And I have had painful evidence, more than once, in discussing the merits of the "Little system of automatic telegraphy" with gentlemen of the Morse persuasion, that my mission would be more popular if I ceased to recommend the new system because of its extreme simplicity. D. H. CRAIG, August, 1872.

* * * But perhaps the most notable events of these early days of the "Little system" were the dignified fulminations of the able gentlemen at the head of the great monopoly. D. H. CRAIG, December, 1872.

Ever since the introduction of the electric telegraph as a means of communicating intelligence rapidly, efforts have been made, both in this country and in Europe, to perfect a system of automatic telegraphy. * * * GEORGE B. PRESCOTT. G. L.

The Telegrapher and the Official Organ.

CLEVELAND, OHIO, July 28.

TO THE EDITOR OF THE TELEGRAPHER.

THE communication of "Ontario," and the sharp rebuke which is therein administered to the Western Union official organ for its attempts to claim everything of importance in connection with the duplex system (since his patents were purchased by the Western Union Telegraph Company) for Mr. J. B. Stearns, was read with much interest and approval, not only by myself but by other Western Union employes. We were surprised at the feeble and ridiculous attempt to break the force of that communication, which appeared in the last issue of the *Journal of the Telegraph*, and anticipated the rejoinder which that article would be likely to call forth from THE TELEGRAPHER. We were more than satisfied, we were delighted at the artistic and scientific manner in which the writer of the *Journal's* editorial was demolished, and especially at the exposition of the ignorance or intentional deception shown in claiming for Mr. Stearns what he expressly disclaims for himself, in connection with the invention of duplex telegraph apparatus. We are now waiting with augmented interest to learn whether the writer of that editorial will comply with the challenge in your reply to point out the points in Mr. Stearns' patent, with the exception of the condenser, essential to a duplex telegraph system. The general opinion, so far as I have been able to ascertain, is that the writer will not, after his former rough experience, dare to undertake a continuance of the discussion with THE TELEGRAPHER, which has thus far so completely and thoroughly demolished him, but will take refuge in a dignified silence on the subject in the future. Some are inclined to think that after what has been said some reply must

be made or attempted. If it should be, we have no doubt but that THE TELEGRAPHER will be able to attend properly to the case.

It is dangerous for the *Journal* to depart from its established policy of general platitudes in its editorial columns, or to undertake to tilt with THE TELEGRAPHER, especially when it has so weak a case. It is quite probable that this fact will be recognized at headquarters, and that you will for the future be let severely alone.

Your explanation of the difference between an independent telegraphic journal and an "organ" was excellent, and its sharp points are fully appreciated by the fraternity, more especially by those who are employes of the Western Union Telegraph Company. You are making THE TELEGRAPHER not only an instructive but a readable and interesting paper, and have the good wishes of a large majority of the reading telegraphers of the country. May you prosper in the good work, and may the subscription list increase with a rapidity commensurate with the deserts of the telegraphers' paper. Of advertising I see you have plenty. BUCKEYE.

Some Bulls—by the Perpetrator.

TO THE EDITOR OF THE TELEGRAPHER.

CONTRARY to the general rule of driving your "cattle" to other folks' pasture, I'll acknowledge these as my own: "Express my coat to (sig.) *Ourney Sign-piper*." After studying over that "sig." for half an hour or so I got it, "Express my coat to *Signourney* (sig.) *Piper*." Another for a Mrs. "*Shoiman*." I hunted the city over myself, but to finally copy the name in Morse characters to find "*Mrs. Sherman*." Received notice of an excursion to hear "*Col. Fax*" speak, but not remembering such an army officer's name, concluded it must mean *Colfax*, which latter proved to be the case. But I've quit perpetrating such things now. "MR. BRAN."

Necessity for a Telegraphers' Association.

TO THE EDITOR OF THE TELEGRAPHER.

IT affords me great pleasure to read THE TELEGRAPHER each week, and I find all parts of it interesting and instructive; but lately I have been more than ordinarily interested in a subject which has been agitated by a number of your correspondents, namely, the expediency of organizing an association for the purpose of protecting and improving our mutual interests. Ever since I first learned, or rather commenced to learn to wrestle with "bottled lightning," I have felt that we, as a class, are badly in need of such a society, and have daily been hoping that some one better known and more experienced than myself would take the initiatory steps in the matter, but there seems to be a general hanging back, and disinclination to do anything more than talk about it. There is one idea which seems to prevail among the fraternity in regard to managers, superintendents and others in authority having a prejudice against such an organization, which seems to me to be rather erroneous. Let an association be organized with a fully defined purpose to improve not only the interest of employes but also employers, by a determined opposition to such a wholesale manufacture of "plugs" as is going on at present, by a classification of operators, and many other much to be desired objects which such a society could accomplish, and we will very soon find that we have the sympathies and co-operation of managers and superintendents.

It is hardly necessary to speak of the so-called "telegraph colleges," except to denounce them as frauds both in intention and result, as there is hardly one of ten who attend them for a term of six months that will be tolerated on any wire or in any office; but the great evil to our profession is the great numbers who are learning in way offices all over the country, regardless of their abilities or education. The consequence is, there are multitudes of ignorant, inefficient operators, who are ready to take a position anywhere at any pay, and as many offices have too little business to pay a good operator, superintendents are compelled to hire them.

Imagine the delay of business caused by the manager of an office in the western part of New York State, who accomplished the astonishing feat of receiving an ordinary death message in thirty minutes by actual timing—said message containing nine words, exclusive of address and signature—the wire and instruments working well. Another manager of my acquaintance, who had one operator and a message boy under his control, only occupied ten minutes in receiving a message of equal length; but then "the race is not always to the swift." A short time since he copied and delivered a message which read, "Can you beat sticaborines Monday, if not, where will Emily go?" This was unintelligible to the party addressed, and with the aid of operator and message boy he managed to make it read, "Can you be at St. Catharines Monday, if not, where will I meet you?" comment is needless. Another bright youth, in a large repeating

station not far from New York, happened to arrive at the office earlier than usual in the morning, and finding all the wires open asked a brother operator what was the matter. Upon being informed that there was a "Jones Lock Switch" at the terminal station, he remarked that "he didn't see the use of locking the wires up over night" I trust some one who is experienced in such matters will take this matter in hand, and do something more than I am now doing—talk. I feel certain that if such an association is once started the fraternity at large will respond to the call, and in a short time we would have a thriving and useful organization, of which we will be proud.

C. WETAIRS, R. J.

Telegraph Train Orders and Reports.

STEVENSON, ALA., July 22.

TO THE EDITOR OF THE TELEGRAPHER.

SOME time ago several interesting articles on the above subject were published in THE TELEGRAPHER. I am not a train despatcher, but have worked for different roads, both north and south, but on none of them have I found so simple a system as is used on this road—the Nashville, Chattanooga and St. Louis. To illustrate I will briefly mention two or three points.

In giving orders to extra and construction trains this form of order is used:

"C D 22.

To West

S

Run to Chattanooga extra (12).

Sig., J. W. T."

"C D 22.

To Carroll

S

Work between Stevenson and Shellmound extra (12).

Sig., J. W. T."

Is it any better or safer to say, "Run to Chattanooga, keeping out of the way of all regular trains," or, "Work between Stevenson and Shellmound, keeping out of the way of all regular trains.

On this road 12 means, "How do you understand?" 13 means, "I understand." I consider this an improvement. It is not exactly proper to have signal "13" mean two different things.

Another great saving is made in train reports. When every station reports arrival and departure of all trains in figures much time is uselessly wasted. On this road passenger trains leaving stations on time, or not over two minutes late, are simply reported "O. T." (on time); if late, the arriving time is not reported, unless the train stops over three minutes, but the departure is given in figures; but as passenger trains are nearly always "O. T." we seldom have occasion to use figures in reporting them. In reporting freight trains the arrival is given in figures, the departure, when on time, is given "O. T." same as passenger trains.

By following these and other rules which I will mention in my next, much more work can be done over a line and on busy roads. This is a matter of considerable importance. H.

How a Short Line May be Made to Work with More Strength.

DOUBLE WELLS, GA., July 22.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE a line one third of a mile long, use eight cups Collaud battery and two No. 1 pony sounders. Line works so weak that it cannot be heard distinctly; can I make it work without using relays; if so, how can it be done? By answering through the columns of your valuable paper you will greatly oblige an interested plug. F. H. O'BRIEN.

Answer.—Your difficulty may arise either from an insufficient earth connection at the ends of the line, or from insufficient resistance in the magnets of your sounders. It is necessary to have a more perfect earth connection for a short than for a long line. If the difficulty arises from this cause it may be remedied by running another wire and working the instruments on a metallic circuit. If from lack of sufficient resistance in the magnets, by having them rewound with finer wire.—[EDITOR OF THE TELEGRAPHER.]

A Reply to Mr. Howe.

MITCHELL, IOWA, July 22.

TO THE EDITOR OF THE TELEGRAPHER.

IN reply to Mr. Howe's inquiry, suppose a current does flow to line from I B', this current alone will not attract armature of relay R' if adjusted high enough. S. J. M. BEAR.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, AUGUST 1, 1874.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Telegraph Lines in the Streets of Cities.

In the *Staats Zeitung*, a German daily newspaper, published in this city, for July 22d is printed an article on "Telegraph Lines in the Streets," which embodies the views of Mr. WM. ORTON, the President of the Western Union Telegraph Company, on the subject of placing the wires underground in cities, and especially in New York, where the multiplicity and constant increase in number of the telegraph poles and wires has become a serious inconvenience. We have had the article translated for our columns, as follows:

"The desire has been frequently expressed that the unsightly telegraph poles might be removed from our streets, and the eyesight cease to be offended by the festoons of rags, paper, kite tails, etc., so frequently suspended upon the numerous wires overhead. In the principal cities of Europe the telegraph wires are laid underground, and the idea of introducing this system in the cities in this country, and especially in New York, has often been mooted. Mr. Wm. Orton, the President of the Western Union Telegraph Company, has, however, always strenuously opposed the introduction of this system. The principal objection urged by Mr. Orton is the difficulty experienced in working satisfactorily subterranean or underground lines. In reference to this objection the statement of Mr. Culley, the Electrician of the British Government Postal Telegraphs, covers the point—that is, that no attempt to solve the question of laying and working underground wires need be expected to be made as long as it is possible to carry them on the surface.

Mr. Orton further asserts that the damage done to the wires by storms and violent winds is not as disastrous and troublesome as the damage and injury caused by lightning upon wires underground. The cable lines passing through the Hudson river are often injured in this way, and expensive repairs are continually required on them in consequence. Sometimes the gutta percha insulating coating is melted, and not unfrequently even the wires are destroyed.

Mr. Orton also referred to the interruption of traffic on the streets if 500 underground telegraph wires are to be in use in the city; the streets would be constantly torn up and travel interfered with; and besides, the permanence and reliability of the wires underground would be interfered with and interrupted by the sewer and other necessary work upon the streets. In Paris the underground telegraph wires are practicable in consequence of the system of immense sewer canals which underlie the entire city, and through which the wires are carried; and in London this is also partially the case. In no American city of any size, Mr. Orton claims, has it thus far been possible to lay and maintain an underground telegraph.

But, in spite of all these objections and difficulties,

Mr. Orton states that the Western Union Company has determined, as soon as the new building now being erected for that company is completed and occupied, to try the experiment, and determine whether the wires of the company can be placed and operated underground without causing too great an outlay by the company, and without injury to their practical working."

This subject is one of such pressing and daily increasing importance that its practical consideration cannot be much longer delayed, and we are pleased to learn, on such excellent authority, that the Western Union Company has determined to attempt a practical solution of the problem. The first objection made by Mr. ORTON, according to the *Staats Zeitung*—that of the difficulty of working satisfactorily the underground wires—would have some weight if it were proposed to carry them underground for a considerable distance, but for the few miles of subterranean lines required to relieve the streets of this and other cities of the unsightly and cumbersome telegraph poles, and the nuisance of a multitude of wires crossing and re-crossing in all directions over the streets and buildings of the city, the static induction would be scarcely perceptible in their operation.

The further objection—the damage to which such wires are subject from atmospheric electricity or lightning, can be effectually guarded against by proper arrangement of lightning arresters, and by proper and thorough insulation of the wires. This is provided for in a system of glass lined iron pipes, through which the wires, properly insulated, are conducted, which has been patented in this country and in England, and which we think must eventually be adopted for this purpose.

The real and principal objection of the telegraph managers is disclosed in the latter part of the article, and that is the expense of such a system to the telegraph companies. This is unquestionably a serious matter; but the expense can be so divided, by having the wires of all the companies and of private parties included in one system, as to make it relatively less onerous; and by this means a large part of the difficulty arising from the constant digging up of the streets may be avoided. A company for this purpose was chartered by the legislature of this State a year or two since, but we do not hear that it has made any material progress with the work.

The Decision of Judge Drummond.

IN the last number of THE TELEGRAPHER we printed a report of a decision by Judge DRUMMOND, of the United States Circuit Court, at Chicago, of considerable importance to telegraph companies. The case arose from the attempted construction of a line along the route of the Rock Island Railroad, between Chicago and Omaha, under the Act of Congress of 1866, which gives the right to any telegraph company that had accepted the Act to construct its lines on any post route in the United States. After setting a few poles the telegraph company was ordered to desist, and the company applied to the United States Circuit Court for an injunction restraining the railroad company from interfering with the construction of their lines. The case coming before Judge DRUMMOND, after argument, he decided adversely to the telegraph company, and the injunction was refused. The case will probably be carried to the Supreme Court of the United States for final decision. It is of great importance to all parties that there should be, as speedily as possible, an authoritative and final decision of the question whether railroads on which the United States mails are carried are post-roads, within the meaning of the Act of Congress of 1866, and subject to the right of way conferred by that Act upon telegraph companies.

There have been three decisions upon this point in the lower United States Courts, two of which were in favor of the telegraph companies, and this last decision by Judge DRUMMOND, adversely to them.

A similar case, which was decided in favor of the Southern and Atlantic Telegraph Company, has already

been appealed to the Supreme Court, and it is believed that a final decision can be had during the term which commences in December next at Washington.

Gray's Telephone.

AN erroneous idea of the Telephone, recently invented by Mr. ELISHA GRAY, of Chicago, Ill., has been given by the account printed in the *New York Times*. The invention, as it really is, is a most ingenious and likely to prove a useful one.

Mr. GRAY's method of transmitting musical tones and reproducing them at a distance is briefly as follows: Imagine an ordinary induction coil with the secondary wire continued so as to include a telegraph line of say 1,000 miles. Let a man place his body in this circuit by taking hold of the wire with his left hand, and laying his right hand upon some resonant substance, a conductor of electricity, which becomes the other electrode. If induced currents are made to flow in the secondary circuit in the usual way, there will arise a quivering in the muscles of the man's right hand, which produces a vibration in the resonant substance sufficient to be easily heard. And the sound which results from this contact of the man's cuticle with the sounding electrode is always of the same pitch with that of the vibrating spring which breaks and closes the primary circuit.

The principles thus briefly stated are a discovery made by Mr. GRAY, and, so far, no one has appeared to claim to have made the discovery before him. They are of great scientific interest, and as Mr. GRAY has already shown a genius for applying the principles of electrical science to practical results, we hope his new discovery will be made practically useful and thereby become an invention.

In a future number we shall indicate, in detail, some of the methods by which this result promises to be attained. At present we will merely say that as a matter of fact Morse writing has been sent through long lines, and received by this method with less than one hundredth part of the battery power commonly employed. Very competent judges, as good, probably, as we have in this country, are inclined to think that by this method the speed of cable transmission can be greatly augmented. Experiments seem to indicate that the Telephone is the basis for a practical multiplex telegraph system.

From the foregoing concise description of this interesting and brilliant discovery it will be seen that we were right in the surmise, expressed in our issue of July 18th, that Mr. GRAY was not responsible for the account of the telephone which was published in the *New York Times*, and extensively copied by the daily papers in all parts of the country. For his method, both of transmitting and of reproducing the tones, is so novel and so infinitely ahead of the VAN DER WEYDE process, that great injustice was done by applying to it the language used to describe the old process, which has long since proved to be of no value.

And as an evidence that Mr. GRAY, and his attorney, ALEXANDER L. HAYES, Esq., of Boston, are not open to the charge of ignorance of what has been done heretofore in the same direction, we will state that the specification of one of Mr. GRAY's patents contains a description of the VAN DER WEYDE telephone, for the purpose of contrast, and this description was on file in the Patent Office six weeks before the *Times* article appeared.

Mr. GRAY has been allowed two patents on two different applications of the telephone—both applied for and allowed at the same time. He is going to Europe to complete his experiments in regard to cable working. We wish him all the success which he so well deserves, both on account of his ingenuity in electrical devices and the unassuming manner in which he conducts his labors.

JOSH BILLINGS says, "Success don't konsist in never making blunders, but in never making the same one the second time."

The Cincinnati Industrial Exposition.

SINCE the notice of the Cincinnati Industrial Exposition of 1874 was printed in THE TELEGRAPHER of July 11, a supplemental premium list has been issued by the Board of Commissioners, which will be of interest to telegraphers and manufacturers of electrical and telegraphic instruments and apparatus. The mistake of the Commissioners to which we alluded—that of putting the electrical and telegraphic apparatus in the same class with optical and philosophical instruments—has been rectified, and they will this year be in a class by themselves. The following additional premiums are offered in class 60:

- Best General Display of Telegraphic Instruments and supplies—gold medal.
- Best Type Writer—silver medal.
- Best Amateur Telegraphic Instrument—bronze medal.
- Best Electric Bell—bronze medal.
- Best Automatic Mercury Fire Alarm—bronze medal.
- Best Electric Medical Apparatus—bronze medal.
- Best Insulator—bronze medal.
- Best Electric Clock—bronze medal.
- Best Insulated Covered Wire for Office Use—bronze medal.
- Best Insulated Covered Wire for Line Use—bronze medal.
- Best Electric Gas Lighting Apparatus—bronze medal.
- Best Printing Instrument for Private Lines—bronze medal.
- Best Burglar Alarm—bronze medal.
- Best Automatic Telegraph System in Operation—bronze medal.
- Best Duplex Telegraph System in Operation—bronze medal.
- Best System Telegraphic Call Bell, for Stores, Manufactories, etc.—bronze medal.

Mr. E. C. ARMSTRONG, of No. 318 West Third street, will take charge of any electrical and telegraphic apparatus which parties may desire to exhibit, who cannot conveniently attend the exhibition personally, and will see that they are properly displayed and taken care of, and will also attend to returning them at the close of the exposition. For his services he will make no charge, only requiring that the entrance fee and actual expenses incurred shall be paid by the exhibitors.

We can guarantee that anything intrusted to his care will be properly attended to, and that whatever he promises he will perform.

The coming exhibition promises to exceed in completeness and brilliancy either of those which have preceded it, and to surpass any similar display ever made in this country. No labor or expense will be spared to make it the industrial exposition of the present year. The achievements in this line on the part of the managers are a sufficient assurance that what they undertake they will perform in the best and most satisfactory manner.

The New Atlantic Cable.

THE steamships Faraday and Ambassador will probably, by the time this paper is printed, have completed the laying of the cable of the Direct United States Cable Company between Tor Bay and the coast of Newfoundland, and be ready to start on the return voyage to England to load the cable to be laid between the coast of Ireland and Newfoundland.

We understand that the cable between Tor Bay and Rye Beach has been connected with the instruments, and that that section, at least, works very satisfactorily.

It has not yet been determined whether the cable will be landed in Newfoundland or not; but if matters should not be satisfactorily arranged by the time the long section of the cable is laid, the two ends will be spliced together, and Tor Bay, Nova Scotia, will, for the present, at least, be used as the repeating station. The additional lines of the Atlantic and Pacific and Franklin Companies will be completed to Portsmouth and Rye Beach, N. H., in ample time to establish the

connection with the new cable, when its laying is completed.

Failures to Receive The Telegrapher Regularly.

WE have lately had many complaints from subscribers of failure to receive their copies of THE TELEGRAPHER, transmitted through the mails, regularly. We can only say that the papers are mailed regularly at this office every Friday afternoon, and should reach subscribers within three hundred miles of New York on Saturday or Monday, according to distance and mail facilities. The wrappers are directed by the same person who has done the work for the past two years, and every care is taken that none shall be omitted. In many cases where such failures occur an investigation at the receiving Post-office will discover where the difficulty lies. Where such failures occur frequently subscribers should insist upon a thorough search being made at the office for the missing papers. It is not improbable that with all reasonable care and diligence a name may be occasionally missed in preparing the wrappers, and a paper occasionally get missent or lost in the mails, but when, as is sometimes the case, as reported to us, the paper fails to the same person every two or three weeks the difficulty will usually be found in the local Post-office, or in the appropriation of the paper by some impecunious or larcenous telegraphic associate.

We are always willing to supply duplicates of missing numbers whenever informed of the failure to receive them.

A Telegraphic Insurance Agent.

Mr. W. C. LONG, of the Western Union Telegraph office, Chicago, Ill., has accepted an agency of the Protective Life Insurance Company of that city. He retains, at least for the present, his position with the Western Union Co., and has opened an office at his residence 170 Centre street, Chicago, with office hours from 7 P. M. to 10 P. M., where he can be seen every evening except Sunday between those hours.

Mr. LONG is an industrious and intelligent telegrapher, and deserves to succeed. We have no doubt the fraternity in Chicago will do all they can to aid him in this new undertaking.

Personals.

Mr. WM. HOLTHAM, late manager of the Maysville, Cal., office of the Atlantic and Pacific Telegraph Company, has been appointed agent and operator for the Central Pacific Railroad at Modesto, California.

Mr. H. W. FULLER, late freight clerk and operator at the depot office of the Central Pacific Railroad at Maysville, Cal., has been appointed manager of the city office of the Atlantic and Pacific Telegraph Company at that place.

Mr. R. J. HEWETT has accepted the position of agent and operator for the Atlantic and Pacific Railroad at Osage City, Mo.

Mr. J. M. HETRICH, of Superintendent Fuller's office, Phillipsburg, N. J., Central Railroad of New Jersey, has relinquished his situation and left for the West to engage in other business. The numerous friends he leaves behind wish him success and prosperity in his new vocation, and will always be glad to see him back again.

The Telegraph.

The Southern and Atlantic Telegraph Co.

A GENERAL meeting of the stockholders of the Southern and Atlantic Telegraph Company was held at the office of the company, No. 51 New street, in this city, on Wednesday, July 22. Mr. J. R. Crenshaw's resignation as President was presented and accepted.

Amendments of the by-laws of the company were adopted, by which the election of President as well as other officers was made the duty of the Board of Directors, instead of the stockholders, as heretofore, and other changes were made, calculated to facilitate the operations and management of the company.

Mr. Henry Hentz, the President of the New York Cotton Exchange, was elected President *pro tem.*, and Mr. Charles W. Blossom, Vice-president, will have the active executive management in the future.

Progress of the New Atlantic and Pacific Telegraph Line.

THE new line of the Atlantic and Pacific Telegraph Co., between Chicago and Omaha, has been completed to Joliet, Ill., and the office at that place was opened for business on Wednesday last. The poles for this line are all up as far as Rock Island, and the work is progressing favorably. The decision of Judge Drummond, reported last week, does not interfere at all with the progress of the line.

Foreign Telegraphic Notes.

THE receipts of the Submarine Telegraph Company for the month of June, 1874, amounted to £8,647—an increase of £829 over the corresponding month of 1873.

The traffic receipts of the Great Northern Telegraph for the month of June amounted to 391,913fr., and for June, 1873, to 265,763fr. The aggregate receipts for the six months ending with June amounted to 2,089,408fr. (£83,576), and for the corresponding period in 1873 to 1,450,239fr. (£58,009).

The principal submarine telegraph companies recently held a conference at the offices of the Eastern Telegraph Company, in Broad street, London, for the purpose of examining and revising the regulations which were sanctioned by the Telegraph Convention of Rome, with a view of submitting at the next International Conference, to be held at St. Petersburg next year, such alterations as may in their opinion tend to the more effective working of the international telegraph system, and more especially as regards the regulations concerning telegrams exchanged with countries out of Europe. Major Bateman Champain, R. E., represents the Indo-European Telegraph Department; Sir James Anderson, with whom are Mr. Wells and Mr. Ansell, the Eastern Telegraph Company; Mr. Weaver, the Anglo-American Telegraph Company; Mr. Andrews, the Indo-European Telegraph Company; Colonel Glover, India Submarine Telegraphs; Mr. Eriksen, the Great Northern Telegraph Company; Major Wood, the Western and Brazilian Telegraph Company; Mons. Chauvin, the Direct United States Telegraph Company; and Mr. Malcolm J. Brown attended on behalf of the English Telegraph Company.

The report presented to the Eastern Telegraph Company, on the 14th ult., recommended a dividend of 4s. per share, making, with their previous payment, 6 per cent. for the year, and an appropriation of £38,993 to reserve, thus raised to £121,838.

The financial report of the *London Railway News*, for the week ended Friday evening, June 17, states that telegraph securities had exhibited considerable firmness in the London market.

During the past week the prices of the leading securities have advanced. At the settlement just completed the names passed for investment in these securities were of an influential character, and the supply of stock in the hands of dealers extremely limited. Anglo-American, Eastern and Eastern Extensions have fully recovered the quarter's dividend just declared. It is understood the traffic receipts over all the lines are rapidly augmenting, in sympathy with the general revival of trade. Added to this, the preliminary arrangements now being made by the representatives of the various companies to attend a telegraphic conference at St. Petersburg, give confidence to investors that the interest of the shareholders, equally with that of the telegraphing public, will receive a due amount of attention.

It was expected that the Great Eastern would sail July 27, to lay the fifth cable of the Anglo-American Company, which has been paid for out of the reserve funds of the company, and which will consequently be purchased without any increase to its present capital.

In the six months ended June 30, 1874, the value of telegraph wires, apparatus and material exported from Great Britain was £1,579,754; in the same period in the preceding year, £702,440.

The Black Sea telegraph cable, between Constantinople and Odessa, has been opened at a charge of 12fr. for twenty words.

The Anglo-American Telegraph Company have notified that the 1866 cable, which was broken on the 13th of April last off Valentia, Ireland, has been successfully repaired by the company's steamship, the *Minia*, Captain Welch, and that it now works perfectly.

The Telegraphic System in the Island of Cuba.

THERE are twenty-four different telegraphic circuits established in the island of Cuba, and the number of telegraph offices exceeds 200. Cuba also forms the centre of an important submarine telegraphic system, consisting of three cables—that from Havana to

Florida; that from Batabauo to Santiago de Cuba, belonging to the Cuba Submarine Telegraph Company, and that from Santiago de Cuba to Jamaica, belonging to the West India and Panama Telegraph Company.

How a Practical Joker was Sold.

We will run the risk of it being old to our readers, although old to records. Some six or seven years since, our well known, quiet and reticent friend Charley Scott, lately at Detroit, being seized with a sudden freak of hilarity, thought to create wholesale sport for this office by ringing in a sell on the boys, making a confidant of Billy King, who, by the way, now edits the *Evening Herald*, Evansville, Ind. 'Twas in the dead of winter; icicles were prevalent, and a warm fire one's best friend. But great sacrifices must be made for fun. Charley, armed with a *Commercial* of ancient date, bled to the battery room on the ground floor, with the temperature of Siberia, selected an old special, and called C. In the meantime the boys had been posted by William, and some one answered "IIC," and passed on to another instrument. Charles then started at a brisk pace with a two thousand word special, gradually increasing his speed. Now and then some one would, in passing, open the key and say to go ahead, last word, and pass on. With confidence Charley proceeded, and when he closed some one happened to be passing, and said O. K. Charles then ascended the five flights of stairs and gained the operating room, and, after partially thawing out, asked Billy to see a copy of a long special which he understood was received. Billy said it had been sent to the *Commercial* office. Rush No. 2 to *Commercial* office and found all specials had been sent to the compositors' room. Four flights more, and, upon inquiry, the compositor promptly remarked, "Get out of here, you're drunk." Charley returns to the office, with perspiration flowing in torrents from his brow, and was met by sounds of mirth and hilarity. The whole office on one wasn't fair, and he went home; but he wasn't mad! oh, no! —*The Plug.*

Dog Killing by Electricity.

WHETHER the slaughtering of scores of dogs by carbonic acid gas, as practiced in this city, is a painless operation to them seems rather questionable from the length of time which their struggles continue. A correspondent asks why cannot electricity be used? He suggests that with a powerful battery and a good sized Rhumkorff coil, that will give a spark of from twelve to eighteen inches, thirty or forty dogs at a time might be killed instantly and painlessly. The wires could be led along the floor connecting with every staple to which the animals are secured. The chain and metal collar would serve to conduct the shock to the body. —*Scientific American.*

Miscellaneous.

THE MAGNETIZATION OF STEEL.—If a recently tempered steel needle be introduced into a magnetizing bobbin connected with a battery of constant current, battery and bobbin comprising the circuit, it acquires a total determined magnetism at the end of a period which appears not to exceed that of its introduction. On slowly withdrawing the needle, it is found to retain residual magnetism which, together with the total magnetism, increases with each repeated introduction until a limit is reached. The needle may be magnetized in the bobbin by three other methods:

1. *Establishment.*—Introduce the needle; establish the current; slowly withdraw the needle.
 2. *Interruption.*—With a closed circuit introduce the needle slowly; break the current and withdraw the needle.
 3. *Instantaneous Charge.*—Introduce the needle; establish and break the current; withdraw the needle.
- Repetitions of any of these three processes (all things being equal) insure an augmentation of the needle's magnetic movement.

LIGHTNING rods just now are a current topic, both on account of the thunderous summer at hand, and of the seasonable liveliness of the paramilitary rod vendors. Rods which invite the lightning and assist it to cleave things generally after its arrival, are unquestionably of a discouraging sort. A German physicist proposes to utilize poplars by inserting in the lower part of the tree a metallic rod connected with the earth by a chain, so that the electric fluid cannot leave the tree to dart at any object placed within a short distance. The poplar tree is not a handy sort of thing for an agent to carry about with him; but in some way he will manage to do it.

Everything can be learned, even virtue.
Placed on file—the handle.
Variety is the spice of life.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

JULY.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
23	71½ 72½	.....	.....
24	72½ 73½	.....	.....
25	72½ 72½	.....	.....
27	72½ 73½	.....	.....
28	72½ 72½	.....	.....
29	72½ 73½	.....	.....

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended June 23, 1874, and bearing that date.

152,427.—**ELECTRIC LIGHTING ATTACHMENT TO GAS BURNERS.**—Adolph T. Smith, New York, N. Y., assignor, by mesne assignments, to Abraham L. Bogart, same place. Application filed March 19, 1874.

Turning the cock closes circuit to magnet, which actuates the armature, which, in turn, makes and breaks the circuit till the turning on be completed. The break being near the issuing gas, it is lit by the spark thus made.

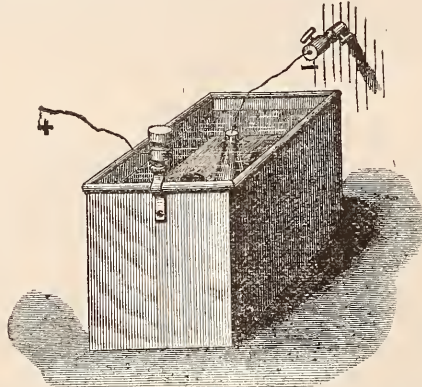
1. The helix D, arranged on the body of a gas burner, said body being made to form the core of the helix, in combination with the armature P, and contact points a b, and an electric circuit, substantially as described.
2. The combination of the burner A, helix D, armature lever E, and wires a b, with a switch spring, G, and cam H, secured to the plug of the gas cock, all constructed and operating substantially as set forth.
3. The cam H, provided with two wings, e e, in combination with the gas cock C, substantially as and for the purpose described.

152,444.—**MAGNETIC SAFETY OR RELIEF VALVE.**—Chas. S. Westland, Providence, R. I., assignor of two thirds his right to William D. Hilton and Alanson Work, same place. Application filed April 27, 1874.

The valve lever being raised its contact with the magnet is broken, diminishing the force acting to hold the valve shut, allowing it to open widely.

1. The combination, substantially as described, of a magnet with a safety valve which is held to its seat mainly by a spring, or by a weight—the magnet operating in conjunction with the weight or spring for the purposes specified.
2. The combination, substantially as described, of an adjustable magnet with a safety valve, whereby the magnet may be made to exercise a variable degree of force in holding the valve to its seat, substantially as described.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.) 38 VESEY STREET, N. Y.

TO ELECTRICIANS AND INVENTORS.

OFFICE OF THE UNION ELECTRO-MOTOR CO., }
62 BROADWAY, NEW YORK, July 3, 1874. }

The attention of Electricians and Inventors is invited to the following proposition:—The

UNION ELECTRO-MOTOR COMPANY
Desire to procure a
GALVANIC BATTERY

Fulfilling the following requirements:

1. It must be capable of maintaining a steady current of 61 amperes per second through a resistance, external to the battery, of two tenths of an ohm, with not more than six pairs of plates. This is, approximately, equal to the current developed by 3 of Chester's No. 2 carbon cells, charged with mixed nitric and sulphuric acid in the porous cells through 50 feet of No. 18 copper wire .049 inches diameter.
2. It must be absolutely free from fumes, and from liability to leak or spill its contents under any ordinary circumstances. If possible, it is desirable that a battery should be provided to work without liquids—in other words, a dry battery.
3. It must be capable of standing for a considerable length of time unused without material depreciation, and yet be ready to give out its full power at a moment's notice whenever required.
4. It must be self-supplying to an extent which will render it capable of furnishing a current, as above stated, for not less than 300 hours in succession without renewal.
5. Other things being equal, preference will be given to the battery occupying the smallest space.

For the best battery fulfilling the requirements herein specified a premium of

FIVE HUNDRED DOLLARS

will be paid, in accordance with the decision of the judges, if the battery is adopted by the company—which shall also have the privilege of exclusive ownership by paying the additional sum of

FIFTEEN HUNDRED DOLLARS.

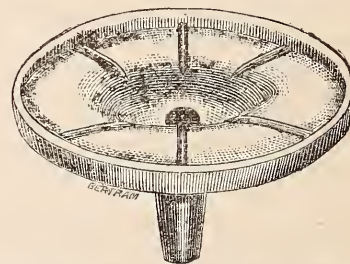
This offer will remain open until November 1, 1874.

Judges.—MERRILL LEFFERTS, President of the Gold and Stock Telegraph Company; GEORGE B. PRESOTT, Electrician of the Western Union Telegraph Company, and FRANK L. POPE, Electrician.

E. B. GRANT, President.

H. H. DUNCKLEE, Secretary.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

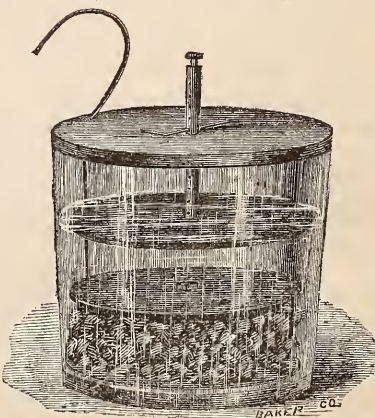
The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



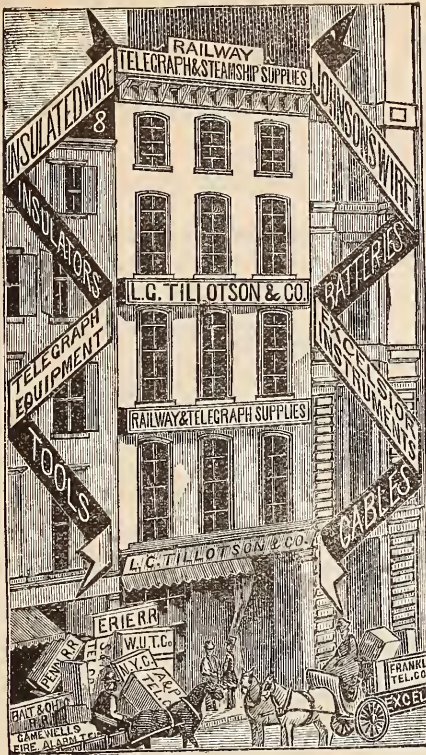
Price per Cell, - - - \$2.00.

This Battery gives a stronger current than the same size Hill or Calland Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

41 THIRD AVENUE,

Chicago, Ill.



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

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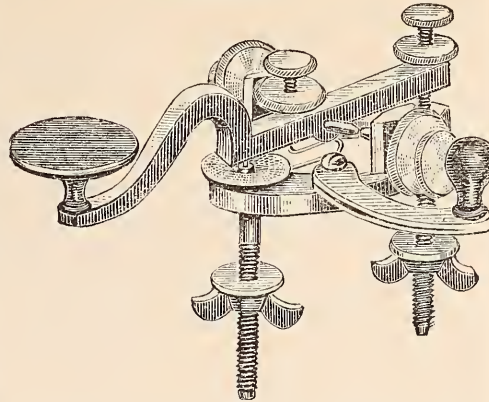
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Does not keep line closed by binding against the anvil. Will not jar open. Slight pressure of the finger required to put lever in circuit or cut out.

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the few instances in which municipalities have been induced to
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The amount of property which has been saved from destruc-
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a most compact and reliable Switch, forming a clean spring-
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A REVISE AND ENLARGEMENT OF THE
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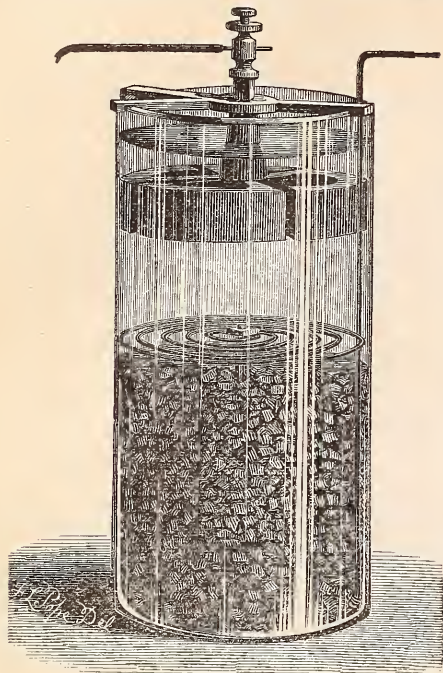
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The publishers will be announced hereafter.

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PATENTED APRIL 8, 1873,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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AT THE
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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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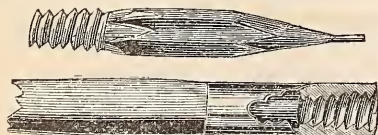
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This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

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Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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UNION BRAND, AND

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KENOSHA INSULATORS, all kinds.

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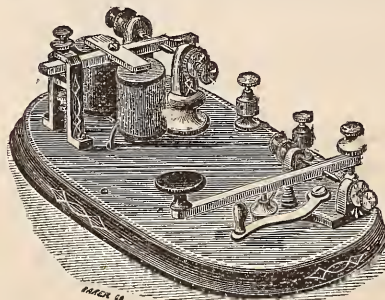
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PRIVATE LINE INSTRUMENTS.



Price, \$10.00.

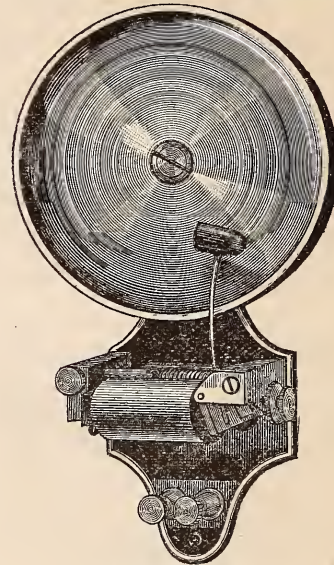
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One half of actual size

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PATENT SELF-CLOSING KEY,

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Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

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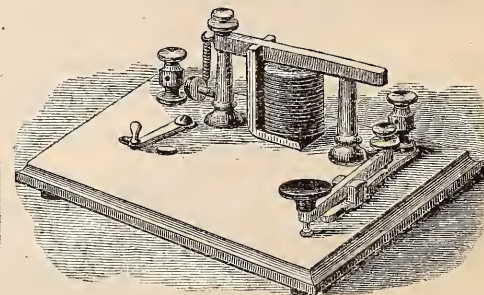
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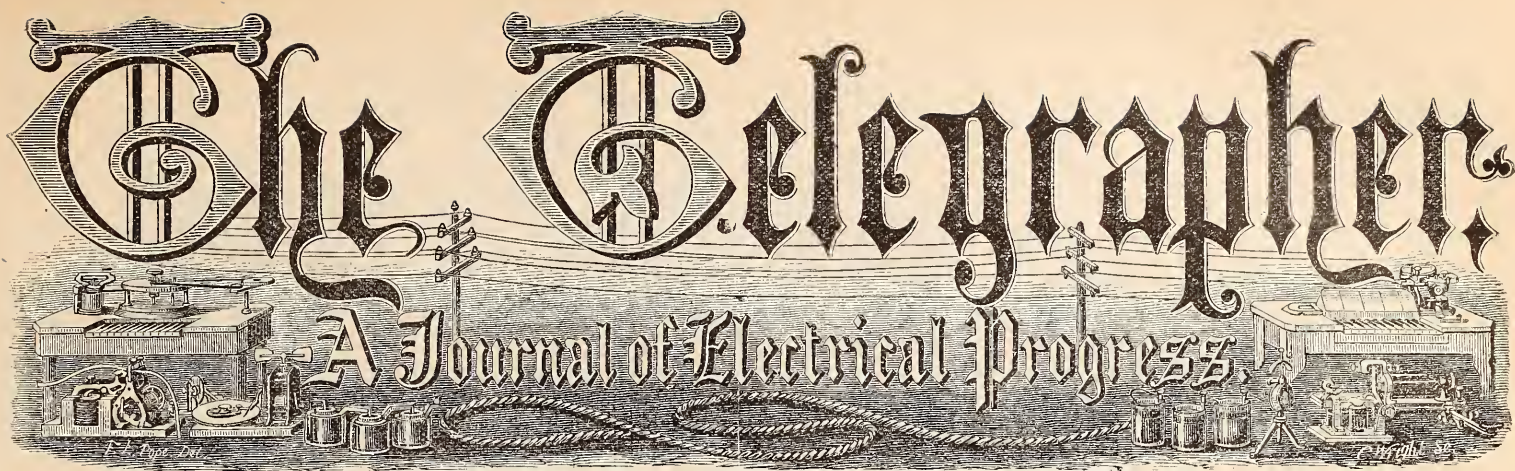
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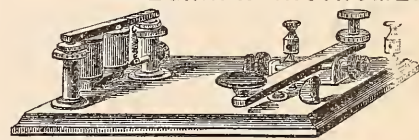
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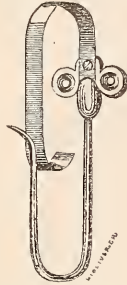
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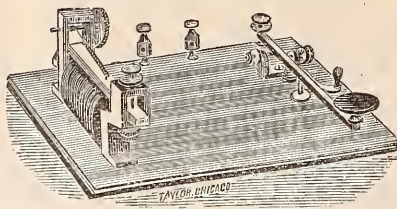
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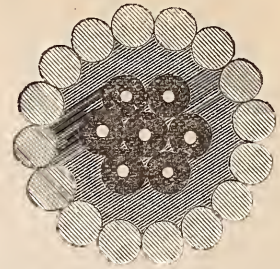
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THE TELEGRAPHER

A JOURNAL OF
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SATURDAY, AUGUST 8, 1874.

VOL. X. WHOLE No. 421.

Original Articles.

The Improvement in Telegraph Line Construction.—Theories and Practical Results in the Past.

BY OLD TELEGRAPHER.

In previous articles which have appeared in THE TELEGRAPHER the writer has referred incidentally to some of the peculiarities of the construction of telegraph lines in the early days of the electric telegraph in this country. It is a subject which might be followed out more fully than it is possible for me to do, with interest and perhaps profit to the present generation of telegraphers. In fact, I do not feel myself qualified to discuss the matter very elaborately, and will, therefore, confine myself to a general consideration of some of the theories of line construction which have found adherents and earnest advocates in the past, with the results of attempts to put them in practice, and of the improvements which have since been made in this direction.

As is familiar to most telegraphers, after the general idea of the electro-magnetic telegraph had been pretty well developed in theory, the first attempt to construct a line over which the signals were to be transmitted was made between Baltimore and Washington—Congress having finally, though reluctantly, and with little or no faith in its success, appropriated forty thousand dollars for the purpose. The original idea was to put the wire underground, in a lead pipe made for the purpose, and a machine for digging the trench into which it was to be buried was devised by Mr. Ezra Cornell and Mr. F. O. J. Smith, both of whom are yet living, in the enjoyment of handsome fortunes, derived mainly from their connection with the development of the telegraph interest. On account of the lack of insulation of the wire encased in the lead pipe this plan was found to be impracticable, and after a few miles of it had been laid the machine was conveniently broken, and operations necessarily suspended for the time. It was decided to put the experimental wire on poles, and the line was finally constructed in this manner, as have been all the long lines in this country since. The line thus constructed worked, it is true; but, owing to bad insulation and the crude character of the instruments employed, it would hardly be regarded as a first class line by the telegraphers of the present day.

In connection with the telegraph everything had to be learned, and line construction among the rest. Some of the ideas which were advanced from time to time, even by those most deeply interested in the success of the telegraph, would greatly amuse the telegraphers, who are now better informed as to what is necessary to constitute a decent telegraph line. Wooden poles or posts were, naturally, in a country abounding in timber, adopted as the support of the wires and insulators, and as they are yet cheaper than any substitute which has been proposed, they maintain their position in this respect to the present day, and are likely to do so for many years to come. Almost every telegraph constructor and manager has his own idea as to the best size for the poles, though generally those of from twenty-five to thirty feet in length have been adopted. Many lines have been built, however, with poles which were comparatively mere pipe stems in appearance. It is not necessary to inform the reader that such lines were and are intended to last only long enough to enable the contractor and builder to get his pay and get out of that section of the country. One superintendent conceived the idea that very short poles were the proper ones to be used, and some years ago a line might be seen along the railroad between Springfield and Worcester suspended on twelve foot poles. The disadvantages of this system of construction, however, soon manifested themselves, and I believe this was the only line thus built.

The theories in regard to the wire conductors employed have been numerous, and not unfrequently as ignorant as might be expected from those who originated them. The surface theory, as it was called—that is, that electricity was transmitted mainly upon the surface of the wire, and that, therefore, the more surface that could be obtained with a given quantity of metal the better would be the conducting properties of the wire—at one time had many believers.

Two or three lines were accordingly constructed with a twisted wire, composed of a number of small strands, and naturally in a comparatively short time became oxidized and very brittle from the exposure to the atmosphere and the alterations of wet and dry weather. Some believed that a small conductor, of No. 10 wire, for instance, was just as good, as it certainly was much less costly to purchase or handle than a larger wire, and not a few lines were built of this, and sometimes even smaller wire. Of course, they did not last long. Others believed in obtaining and using the largest sized conductor possible, and No. 6, and sometimes even No. 4 wire has been used for this purpose.

There is no doubt an advantage in the use of these very large conductors, and when properly put up, if inferior insulation is used they are decidedly preferable. The objections to the use of such large conductors consist in the first place of the greater cost of the wire, and secondly, of the much greater difficulty and expense of handling and putting it up. They necessitate, moreover, large and more numerous poles than relatively smaller wire, and the advantages derived from their superiority as conductors may be obtained in a different and less troublesome and expensive manner. The Western Union Company has used a good deal of this large wire on its new lines on the main telegraphic routes, and has undoubtedly found it advantageous in improving the capacity and reliability of its lines, with such conductors as that company, for reasons which it cannot be difficult to understand, persists in using.

In the first year or two of the construction of telegraph lines copper wire was regarded as essential to be used, and in a metallic circuit at that, requiring two wires in all cases to complete the circuit. The unsuitability of copper wire for the purpose, from its extreme ductility, was soon demonstrated, and also the discovery of the earth circuit obviated the supposed necessity of furnishing an expensive conductor to complete the electric circuit. The discovery of the earth circuit was unquestionably one of the most important which has ever been made as regards facilitating the rapid advance of the electric telegraph throughout the world.

It has been in the insulation of telegraph conductors or wires that the most numerous theories, and the most remarkable displays of genius have been made from time to time. It was understood from the first that some method of insulating the wires was indispensable, but the ideas, as regarded the means of accomplishing this, were exceedingly crude, and as various as the persons propounding them. Glass in some form was employed on all the early lines of telegraph, but some of those who were regarded as bright and shining lights in the telegraphic galaxy of the day regarded glass insulators as too expensive, and one of them, the late Amos Kendall, I think, wrote a sharp letter to Mr. Henry O'Reilly, who was then engaged in constructing one of the earlier lines, for his extravagance in using glass insulators, and suggesting that it would be much cheaper to cut a notch in the top of the poles and wrap the wire with tarred hemp and place it in the notch! Mr. O'Reilly failed to realize the wisdom of this suggestion, and persisted in using the glass insulators, which were the best known at that time, in spite of the expense. The letter making the suggestion is still in existence, and has been deposited by Mr. O'Reilly in the library of the Historical Society, in this city, with a large number of other MSS., and publications, and data, in reference to the early telegraphic history of the country, where they may be preserved, as their value and importance deserve, for present and future use.

For several years glass was regarded as the only practicable insulator for telegraph wires, the only difference being in the shape and method of supporting them so as to secure the best results. Experiments were made with other substances from time to time, but they resulted in the return to glass. Prof. Royal E. House, the inventor of the House Printing Telegraph Instrument, also invented an insulator, which was used to some extent on the House lines, so-called. It was irreverently styled "the dinner pot insulator" by telegraphers of that day on account of its size and peculiar shape. The insulator consisted of an outer shell of iron, cast with the thread of a screw on the inside. The interior of the insulator was coated with glass. A screw was cut upon the top of the pole and the insulator screwed into it. As long as the glass remained intact the insulator was a very good one, but unfortunately the expansion and contraction of the iron from the effects of heat and cold had not been taken into account, and the glass was soon fractured from this cause. Again, the insulator furnished an excellent object upon which amateur sportsmen could exercise their skill with rifles, pistols, etc., and as at that time the wires, especially in the Western part of the country, ran for hundreds of miles through the forests, many of the House insulators were soon decorated with bullet holes, which seriously interfered with their insulating properties. They were quite expensive,

also, costing some fifty or sixty cents apiece, and they did not long remain in use on any line.

It would require too much time and space to recall the many modifications of this idea of Prof. House, of an iron shell, with glass insulation inside, which have made their appearance from time to time, only to be discarded in their turn for the same cause, the impossibility of keeping unfractured the glass coating. Some of these were of such a shape and manufacture that outwardly they appeared to be perfect, while, in fact, they afforded no insulation at all, and, consequently, caused much annoyance and trouble to the operators and line repairers, and great loss and damage to the companies. The Lefferts insulator, so called from having been designed by Gen. Marshall Lefferts, was for some time very popular and quite extensively used. This consisted of a wooden plug, some 16 to 18 inches long, with a knob on the end in which a hole was bored, and in this a glass insulator with an iron hook east in it was placed, and secured from falling out by a wooden pin, which fastened the insulator in the aperture prepared for it. These have gone out of fashion now, however, and none have been made for some years past.

The different styles of fauey insulators which have appeared from time to time have mostly ceased to be made, and the insulators now used are various forms of glass—the best and most generally used being that known as the screw glass insulator—the poorest, that manufactured specially for the Western Union Company and known as the Western Union insulator; the Kenosha or Carbon insulator, and the Brooks improved paraffine insulator. The latter is considered the best, and although its original cost is greater than either of the others, it has shown itself to be in fact the cheapest and most economical.

When we contrast the best lines now built with those which some years ago were regarded as first class, it must be conceded that there has been a decided improvement in their construction. It is true that a good deal of poorly constructed line is still put up, but this is generally the fault either of the contractor, who in this way seeks to increase unduly the profits of his job, or from the parsimony and ill-judged attempted economy or poverty of the company or parties for whom they are built. The use of very large iron wires for conductors, especially by the Western Union Company, has been referred to in this article. The necessity of this for increasing the capacity of the wires may be avoided, either by employing the equivalents of such wires manufactured by the American Compound Telegraph Wire Co., of this city, or by using a more perfect insulation for smaller wires, such as is furnished by Mr. Brooks in his improved paraffine insulator, with which he guarantees, for a small annual payment, to maintain a No. 9 iron wire in continual wet or foggy weather at the same conductivity and capacity as the larger wire under ordinary atmospheric conditions.

The compound telegraph wire manufactured under the patents of Messrs. Farmer and Milliken of Boston, if proper care is taken in putting it up originally, is guaranteed to give the best results. Combining as it does lightness and strength, the conductivity of copper with the strength of steel, it is easily handled, and when once in place should last in effective service for many years. It is essential, however, that care should be taken that it is properly handled, and the patent joint which is furnished with it should be used, as joints and splices made carelessly and in the ordinary way are apt to interfere with the copper coating of the interior steel wire and impair its conductivity. From such careless and improper handling discredit has at times been cast upon this wire which it does not deserve. It is destined eventually to occupy an important and leading position as a telegraphic conductor, and will be extensively used. The smaller number of poles and insulators required when this wire is used really reduces the first cost of a line, especially if the Brooks insulators are employed, to very nearly that when ordinary iron line wire is employed.

Marked as has been the improvement in the construction of telegraph lines heretofore, there is still much room for further improvement. The progress in that direction from year to year is encouraging, and telegraph managers are coming to understand that inferior material and careless construction will not pay in the long run. With such lines as can be built with the material and insulation now available, and with the improved systems of working telegraph lines which are coming into use, the capacity of such lines for business will be largely increased, and the relative cost of the service reduced, so that with them the telegraph, at even lower rates than are now charged, may be made profitable to investors, and afford a better remuneration to intelligent and competent employes.

Mr. ELISHA GRAY, Supt of the Western Electric Manufacturing Co. of Chicago, Ill., and inventor of many valuable improvements in telegraphic and electrical instruments, sails for England in the steamer Baltic, of the White Star line, from New York to-day.

Cap. De Costa.

BY JOHN OAKUM.

THOSE who read a previous paper in these columns, entitled "Posie Van Dusen," may remember that a gentleman bearing the name of Cap. De Costa was incidentally introduced. Less attention was devoted to him than to the others, because he had never performed any of the marvellous feats which so redounded to the glory of Jim Lawless, nor had he ever won distinction in the peculiar respects in which it is vouchsafed that none but McCloskys shall achieve victory and renown; and yet De Costa was an original in his way—a genuine ingot in the mine of humanity. It was his misfortune, however, in common with most of his class, that the retention of lucrative situations is not compatible with a free indulgence in wine and wassail. And thus it came to pass, in the year of our Lord 1860, that Mr. De Costa had been so regularly and persistently dismissed from the service of the American Company, in New York, as to render it somewhat difficult to persuade managers that he deserved a situation. From August, 1860, until June, 1862, very little is known of the gentleman's history or his whereabouts. Vague rumors are still whispered concerning his operations during the period mentioned, but the theories of his disappearance are so diverse in their nature that unless Mr. De Costa possessed the unusual boon of ubiquity he could scarcely have filled the bill. One story runs that he passed the interval in driving a mule team on some route having Santa Fé for its remote terminus; another says he was engaged in New Jersey, where he flourished a shepherd's staff and looked after a flock, as pastoral in their seeming, no doubt, as the average animals from the west, as seen at Communipaw; while still another informant holds that, at intervals during the entire period, telegraphers seeking relaxation in a game of billiards at the National, saw, sometimes hovering in a dark corner, a face mysteriously familiar though changed and shy of notice, and others dropping in at Branch's after "30" for a lunch or some liquid comfort, noticed that a figure, which, according to Mike's testimony had been "hanging over that chair and baking himself all night in a comatose state," always came quickly to an upright posture and disclosed that it possessed legs and the faculty of locomotion, by speedily gliding up the steep stairs and disappearing down Ann street as if propelled by shame and humiliation.

But these distracting theories of De Costa's whereabouts do not alter the circumstance that on the 8th of July, 1862, he appeared in a terribly demoralized condition at the office of a western superintendent, between whom and himself a dialogue, something as given below, is said to have taken place:

"I hear operators is skurce," said De Costa, with the skill of a diplomat. "Good many gone to the war and more going d—n soon; I'm an operator, old man, aud, look here—I want a job."

"Indeed!" returned the gentleman, "but your manner, sir, is hardly what is due to men in my position, and you seem to have been drinking. I really fear we have no vacan—"

"Oh, that's played!" broke in the Captain, "I've been here before; I'm sorry if I ain't been respectful, but, d—n it, man, you don't seem to understand that good operators is skurce." And, as if in atonement for anything unfriendly in his manner, he squirted a stream of tobacco juice in very inconvenient proximity to the official boot, and fell to whistling "Auld Lang Syne."

What he said was true; the demand for operators was threatening to exceed the supply; circulars calling for "sound operators," to go into the army, were freely distributed, and telegraphic officials were well aware that the facilities for handling the wonderfully increasing business were likely to be crippled from a lack of operators. But the superintendent did not fancy the manner of the applicant and he prepared to annihilate him.

"No," he began, "old acquaintance should not be forgot, and with the record which you have, Mr. De Costa, the company is not likely to let your fame pass from memory; but we really don't need you. We only want a few operators just now, and it is essential that those should be absolutely first class—men capable of sending a message with one hand and receiving one with the other—who can work two wires at once, so that—"

"Look here, cully," interrupted De Costa, speaking most confidentially. "Look here, cully, you say you want men that can do that? Well, I'm your oyster. You want to engage me on the spot at your highest salary."

It is not within my province to describe the process of thought by which these two came ultimately to agree. De Costa's impudence may have awed the official into submission, or a fine sense of humor may have led the gentleman to give the veteran another trial. At all events, my friend of the military title found his way to the operating room that very afternoon, and was enrolled on the list at the "highest salary," as he had suggested. During his stay his rela-

tions were tolerably pleasant, though some of his collaborators were taken down a peg or two occasionally by his manner of answering their inquiries. A message of his receiving, containing upward of a hundred words, was once handed to a new operator for transmission to some point in the east. It was beautifully written and filled the blank completely. The sender got on gloriously until he reached the bottom and then he was unable to see the check. He looked for it at the top and on the margin, but his "eager and expectant gaze" was each time disappointed. As a last resource he marched over to Cap.'s desk and said, very dumurely:

"Mr. De Costa, you seem to have omitted the check by some—"

"Omitted the devil," responded Cap., a little pompously, observing, with a wink at his interrogator, "nice oopy, ain't it?" Then he turned it over and pointing to the middle of the back, exclaimed, "Why, you tow topped lunthead, what do you call that?" The check was there on the back, looming up solitary and alone, like the Latin inscription "Hic" on the tombstone of the departed inebriate.

His friends thought he had reformed, and, indeed, his behavior for a few months was so much better than was expected, that the position of all night man, which had become vacant, was tendered him. The duties were light, with hours from 1 A. M. to 8 A. M. As a general thing he took scarcely a half dozen messages, besides sending a little press to San Francisco, and jogged on the even tenor of his way as happy as a bird. But there came a sad, regretful pay day night when Cap. met with a misfortune. He looked upon the wine when it was red. "On horrors head horrors accumulate," you know, so it was not surprising that, after he had relieved his men, that San Francisco should offer a "special." I fancy that deep emotions were working in the old boy's breast when the doleful information came bumping across the plains, but, be that as it may, deep emotions were working in several other breasts next morning. A special, which should have appeared in the New York Tribune that day, for reasons which the reader may surmise, hung innocently on its hook in the San Francisco office until long after the cock's shrill clarion had waked the eoboes of the new born day.

The manager—or "Charley," as the Captain always called him—by some strange chance came earlier to the office that morning than usual, to find the door open, the fire gone out and the room vacant. The butt of a cigar lying on the "overland" desk indicated that De Costa had sat pondering there on his duty and the feasibility of his performing it. The circuit closer was open, a piece of tin, which Cap. always took with him when he changed his base, was gone from the sounder, and on a blank lying loose among many others was written in pencil, in a neat chirography, unmistakably his, the following laconic adieu:

"Charley:

I works no more; I resigns.

CAP."

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Fast Telegraphy.—The Western Union Company Caving in.—The President and Electrician Give it Up.

TO THE EDITOR OF THE TELEGRAPHER.

THREE or four years ago the annual address of the distinguished gentleman who now presides over the Western Union Company with so much dignity and snavity, and who "debates" its peculiar excellences through each succeeding session of Congress, contained the following touches of rhetoric and science—the latter of which was understood at the time to have emanated from that shining light in electrical science, the very popular electrician of the W. U. Co.:

1. "It is currently reported that a new telegraphic bubble is about to be floated, having for inflating power a wonderfully rapid means of transmitting despatches by the automatic process. The patent for the automatic or fast system is owned by the Western Union Company, and no cause, therefore, exists for apprehending its use upon rival lines; but, inasmuch as we have given it a long, thorough and expensive trial, the result of which is that we have discarded it as totally impracticable, I deem it proper to give the subject a brief mention."

(2.) "Messages cannot be sent by this system at a faster rate of speed than by the ordinary apparatus, except over comparatively short distances; that it cannot be used upon a wire strung upon poles with other wires, nor will it work during a magnetic storm,

except by the employment of a double line. Taking all of its merits and demerits into account, it is so greatly inferior to the Morse and other systems in use that it cannot be profitably employed, either in connection or in competition with them."

(3.) "The value of the telegraph does not consist in the amount of time which can be saved by it over the mail or other means of communication, but in the practical annihilation of time. A telegraphic despatch, for example, might occupy two days in going from New York to London, and yet reach there eight days in advance of the mail, but this would not be a proper performance of the functions of the telegraph. Instant and constant communication is what is required, and hence the introduction of any apparatus which interposes an unnecessary delay in the preparation of dispatches, either for transmission or delivery, is a change for the worse. This is a disadvantage which the so-called fast systems labor under, and which will forever preclude their use."

(4.) "The automatic system, however, is especially unfitted for the transmission of press reports, as this process enables but one station to receive at the same time, whilst the Morse wires can be connected throughout the country, and the news sent to every office with a single manipulation."

(5.) "The double transmitter, an apparatus for working both ways over one wire at the same time, has also long occupied a prominent place among speculative telegraphers, and has recently been extensively advertised by the promoters of various competing lines. During the past twenty years there have been several inventions for accomplishing this result, the first being that of Dr. Gintl, of Germany; but while it is possible, under certain exceptional circumstances, to transmit messages both ways at the same time over one wire, the conditions under which this result is obtained are such as to render the general use of the system impossible."—*Annual Report of President Orton, 1869-70, pp. 37-39.*

It is humiliating that gentlemen who have the assurance to present themselves to the shareholders of that great company, should be known to have cherished and promulgated such profound ignorance as to the science of electricity and telegraphy, and at this late day, as we see embodied in the above extracts. Permit me to point out some of the more extraordinary statements embraced in the sentences which I have quoted:

(1.) The "wonderfully rapid means of transmitting despatches by the automatic process," consisted of the modest claim of Mr. Craig on behalf of the Lefferts and Little system of fast telegraphy, of transmitting speed of 150 to 200 words per minute, which was, a few months afterwards, on a fair average Morse circuit of 300 miles, exceeded by more than five times the utmost that was claimed for the new system—over one thousand words per minute having been transmitted as easily as fifteen words per minute can now be transmitted by the Morse system. The "patent" to which reference is made was the Bain-Humaston system, and as a curious illustration of the scientific knowledge which directs this model would-be monopoly, it may be stated that after the Lefferts-Little system had been worked successfully between Washington and New York for over a month, at the rate of over 1,000 words per minute, the electrician of the Western Union Company was called upon by President Orton to make good his assurances, embodied in the Annual Report, that the alleged new fast system was "owned by the Western Union Company," and to this end gave his whole mind to such improvements on one of the New York and Boston wires as even to rival, in electrical tests, the celebrated compound wire used by the Automatic Company between New York and Washington. And whilst this was going on very splendid automatic machines were produced at the machine shops of the Western Union Company, embodying the latest improvements of the combined wisdom of the distinguished electrician, engineer, inventor, master mechanic, executive officers and chief operators—and, to assure the company against the possibility of a failure, that walking magazine of electrical science and mechanical skill, Professor Farmer, was imported from Boston, and the Western Union building was largely surrendered to this brilliant array of talent for some ten or fifteen days. The result is told in a letter before me, from one of the chief actors, who says: "The New York and Boston wire used was in the most perfect condition, and gave better electrical results than the automatic wire between New York and Washington, but we found it impossible to telegraph at any time during our testings, and record so that it could be read, over sixty-two words per minute." So much for the Western Union Company's "fast system," and the brilliant minds by which the scientific and practical departments of the company's vast business is directed. Well might the President say "the Company's fast system was totally impracticable."

(2.) Every one of these statements was true enough, so far as they related to the "fast system" of the Western Union Company; but, as we have already shown, that the systems which the report went out of its way to assail, were as different as *conceded ignorance and modest intelligence*. The statements made in the paragraph quoted were not only destitute of every shadow of truth, but if the author or his scientific adviser had known even the rudiments of *modern* electrical science, he would have realized that his bold assertions were destitute of probability and even of common sense.

(3.) Who, after reading this and the preceding paragraphs, would imagine that the same electricians and executive officers of the Western Union Co. could be induced to travel to Europe and spend months of time in telegraphic investigations, and finally return home with a heavy investment, in this present year of grace, in the antiquated, exceedingly complicated, slow and unreliable Wheatstone automatic system, which has been in practical operation in England for at least ten or fifteen years without commending itself to one of the Continental Governments, where the regular Morse system is preferred for economy, reliability and accuracy? Yet, verily, such is the fact; and those innocent people of the W. U. Co. are so pleased at their success in getting hold of a live system of automatic telegraphy, that their antics are positively laughable. The Wheatstone Perforator requires even more skill to operate it than is required to operate the Morse system, while the perforators of the American fast system can be operated at sight, and they have been worked up to 140 words per minute against a speed of about 25 words by the Wheatstone machine—and, after the Wheatstone machine has perforated a message, it cannot be sent over an ordinary Morse circuit at a rate of speed over above 60 to 70 words per minute, whilst by the American system, which the managers of the W. U. Co. have so grossly belied, it is perfectly easy to transmit messages, in similar circuits, 1,000 words per minute.

(4.) There never was a greater perversion of the truth than is exemplified in this paragraph. The American fast system is absolutely perfect in regard to every matter and thing herein stated, and the press will find it, when it shall have passed into the hands of competent telegraphers, one of the greatest hoons of the century, inasmuch as it will enable every enterprising journal of the country to get over columns of special and exclusive news, from all parts of the country, in less time and for less money than is now required to get over a few paragraphs from Washington. This paragraph was written to deter certain newspaper men from raising, as promised, a million and a quarter of dollars to build trunk lines to the leading cities of the Union, and had temporarily the effect desired—but it was purchasing a respite from effective opposition which will ultimately be dearly atoned for.

(5.) In order to appreciate the exceeding richness of this paragraph on the duplex or double transmitter system, your readers ought to have placed before them the extraordinary paragraphs in the official "journal" of the W. U. Co. in commendation of this old and worthless (because too expensive) system of double or triple writing over one wire—but even the paragraphs to which I refer convey but a faint idea of the *exultation* and glow of language and gesture with which the electrician of the W. U. Co. describes to the gaping crowds, interested in the stock speculations of the company, the improvements which he and that brilliant genius of Newark have brought out in connection with the duplex system—claiming to send and receive from each end of a Morse wire, simultaneously, as many as three or four messages—all of which is undoubtedly true; and the same thing, substantially, has been done at pleasure by intelligent electricians for twenty-five years past. It was done even with the printing telegraph machines, by Professor Hughes, between this city and Philadelphia, as long ago as 1856. But the extraordinary statements of the distinguished electrician, and his every way well matched genius from Newark, are perfectly unctuous when they come to speak of the great *saving* to the company and the great increase of wire facilities for doing business; and in order that your readers and the shareholders may see the opposite side of the picture, I will present the most favorable view of the triple duplex which can, truthfully, be presented, and from it they can judge how long it will take, after the W. U. Co. shall have fully adopted the Prescott-Edison methods of telegraphing, to exhaust the last dollar in the treasury.

As a comparison has been publicly instituted between the American automatic and duplex Morse system, on the score of economy, etc., I will first give the figures for the automatic system and then for the Morse, the duplex, double and triple duplex systems:

Estimate.

Cost of telegraphing 300,000 words over any given circuit:

American Automatic System.

- 15 perforators, each 2,000 words per hour—10 hours, 300,000 words.
- 10 copyists (in Roman print), with 10 readers of telegraph characters, each copyist 3,000 words per hour—10 hours; 300,000 words.
- 2 transmitters and receivers.
- 37 operatives—girls, \$2 per day.
- \$74 actual cost of labor to telegraphing 300,000 words, but the wire only half occupied.

Morse System.

- 30 operators, with 30 wires, send, and 30 operatives receive 30,000 words per hour, or 300,000 words in 10 hours.
- 60 first class operators, \$4 per day.
- \$240 actual cost of labor—over 3 to 1 in favor of the automatic system.

Duplex Morse System.

- 40 operators, on 20 wires, transmit 30,000 words per hour—10 hours, 300,000 words.
- 40 operators receive the same.
- 80 first class Morse operators, \$4 per day.
- \$320 actual cost of labor to telegraph 300,000 words—being \$80 more than it would cost to telegraph by the regular Morse system.

Double Duplex System.

- 45 operators on 15 wires transmit 300,000 words in 10 hours.
- 45 operators receive the same.
- 90 first class Morse operators, \$4 per day.
- \$360 actual cost of labor, being \$120 more than it would cost to telegraph by the regular Morse system.

Triple Duplex System (the great invention of Prescott and Edison).

- 48 operators on 12 wires transmit 300,000 words per day.
- 48 operators receive the same.
- 96 first class Morse operators, \$4 per day.
- \$384 actual cost of labor—being \$144 more than it would cost to telegraph by the regular Morse system, and \$310 more than it would cost to telegraph the same over one automatic wire—the difference in labor being at least *five to one* in favor of the automatic system and against the Prescott and Edison *improvement*. If the managers of the W. U. Co. continue to keep those two brilliant electricians at work, it seems quite likely the company will reach bankruptcy before its shareholders reach another dividend.

However, discouraging as is the exhibition of the duplex humbug, it is really brilliant as compared with the exhibit that will be made with the imported Wheatstone system, which is just now cracking in operative shell at 145 Broadway. ANTI-HUMBUG.

The First Crucial Test of the American Automatic Telegraph System.

TO THE EDITOR OF THE TELEGRAPHER.

I HEREWITH bring to your notice some incidents connected with the first practical test (on a long line wire) of my American Rapid Automatic Telegraph System, June 20, 1869, in the presence of the Hon. Joseph Medill, Mayor of Chicago; Gen. Marshall Leferts, Engineer-in-Chief of the Western Union Telegraph Company; George B. Hicks, Esquire, Telegraph Expert, General Agent of the Western Associated Press, Cleveland, Ohio; Dan'l H. Craig, Esquire ex-General Agent of the New York Associated Press, and several other gentlemen of scientific attainments.

It had previously been arranged with my distinguished friends to meet me on the above date in New York, at such an hour as we could most conveniently have the use of the principal and longest line wires leading out of the city. I at that time resided in Rutherford Park, New Jersey.

On the morning of the 20th of June, 1869, I made my way to the railway depot, to be told by the station agent that all traffic between that place and New York City by rail was at a standstill, owing to the fact that a large freight locomotive had, together with some loaded freight cars, broken down the bridge which crossed the Passaic river, in which the wreck was lying.

"Here was a dilemma." Ten miles from New York by rail—about fifteen miles by the old post road, and no public conveyance—what was I to do in order to fulfil my engagement on Broadway, New York, by midday, and it then being about eight o'clock, A. M., and I still at Rutherford Park? I just made up my mind, "*Deo volente*," to be on hand by hook or by crook, so I trudged on foot about one mile up over the hills to a small farm house, and prevailed upon a Bavarian farmer to hitch up his thin and shabby horse to his much more shabby and much patched wagon. After the fixing of sundry latches he finally got his establishment ready for the start, and drove by the old circuitous route some ten miles to a settlement called Union Hill.

During our journey I inadvertently referred to the inverted cup insulator, so useful throughout the whole

world, and some of which were visible along a portion of our route. Ou which my Bavarian friend, by name Hofman, volunteered to inform me that he was born in the City of Munich, in Bavaria, and that previous to his emigration to the United States of America he was employed as cutter of ornamental stone work; that in the City of Munich he had seen frequently and knew Professor M. Steinheil, the discoverer, in 1837, of "the earth circuit." "And," said my old Bavarian friend, "I shall sell my farm and return to my native City of Munich." (This he actually did some two years later.)

On our arrival at Union Hill I had to let my intelligent and very communicative friend (who, by the by, was a devotee of king Gaubrinus) put up at a Lager Bier Haus, there to await my return in the evening, it being then about 12 M. I then took a horse car and started along the high rocky cliffs towering above the beautiful and noble Hudson river, until I arrived some four or five miles near New York, at a city called Hoboken (a place owned pretty much by the *millionaire* family of the late great engineering genius, Edwin A. Stevens—the founder of one of the most attractive and well kept Technical Colleges in the United States, and which reflects the highest honor, also, on the surviving members of this, the munificent Stevens family, who have a most magnificent seat in the immediate vicinity of the College). I then took a steam-boat down the river Hudson some two miles, after which I had to walk three fourths of a mile to my point of destination on Broadway, New York City, where I arrived in time to demonstrate to my distinguished visitors the *experimentum crucis* in the first practical test of my American system of fast automatic telegraphy—which passed over with marvellous results, such as were by no means anticipated by the learned gentlemen present on that occasion. I got through the demonstration late in the afternoon, and returned to Union Hill, where I found my Bavarian farmer friend in an impotent frame of mind, brought about by an excessive impouring of king Gaubrinus' lubricating fluid. But, notwithstanding that, I was enabled to get him back over the same route to Rutherford Park, where I arrived late at night of the same day, and thus got safely over all the obstacles in the way of travel, and that test has been followed by the practical introduction of that system of telegraphy upon which is now centred the notice of the most eminent men in the field of "electrical science." Involving, among many other salient mechanical features (including new canary color, deliquescent and other chemical formulas), the discovery and application by myself of the *accumulators*, *condensers*, *discharging* "magnetic condenser Rheostat," and the (overflow to earth) "*rheostat dam*."

GEORGE LITTLE, C. E.,
Passaic City, New Jersey, U. S. A.

August 1st, 1874.

Action of Washington, D. C., Western Union Employees on the Death of James T. McCook.

WASHINGTON, D. C., July 30.

TO THE EDITOR OF THE TELEGRAPHER.

At a meeting of the employees of the Western Union Telegraph Company in this city, held on Thursday, July 30th, the following preamble and resolutions were adopted, and the Secretary directed to forward you a copy for publication:

"Whereas, We are called upon to perform a sad and mournful duty—God, in His infinite wisdom, having removed from our midst by death our late pleasant companion and colaborer, James T. McCook, an operator in this office, who died on the evening of July 28, 1874—therefore, be it

"Resolved, That we deeply deplore the loss of our late associate, and desire to place upon record this expression as a tribute of respect, our appreciation of his worth and good qualities, and our deep regret that one of our number, so young and promising, should be stricken down thus early in life.

"Resolved, That our heartfelt sympathy and condolence is hereby extended to the family of the deceased in their severe affliction.

"Resolved, That a copy of these resolutions be forwarded to the mother of the deceased and furnished to the telegraphic journals for publication.

"J. B. AUSTIN, Secretary."

THE Postmaster of this city has made arrangements with the Gold and Stock Telegraph Company, whereby communication will be established between the General Post-office and Stations D (at Cooper Union) and F (at Twenty-fifth street and Third avenue). This change is expected greatly to facilitate postal business, and, if found successful in actual practice, the system will be extended, so as to perfect communication between all the other stations, and also between them and the General Office.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, AUGUST 8, 1874.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

The Telegraphic Situation.

THE present year has thus far proved an exceptional one as regards the extension of telegraphic lines, and the increase of telegraphic facilities in this country. With the exception of the new line of the Atlantic and Pacific Telegraph Company from Chicago to Omaha, to complete the connection of the Eastern with the Pacific divisions of its lines, the new lines required to establish connection at Rye Beach, New Hampshire, with the cable of the Direct United States Cable Company's cable, and the extension of the lines of the Southern Atlantic Telegraph Company towards New Orleans, comparatively little additional line will be constructed. The Western Union Telegraph Company is constructing but little new lines, and its reconstruction is confined to what is absolutely requisite to maintain its wires in fair condition.

The reasons for this exceptional condition of telegraphic affairs are evident—how long they will continue to operate is what cannot now be certainly foretold.

The shock which was given to business and enterprise by the unexpected panic and prostration of business last fall was so severe, and the causes which led to it were so deep and serious, that necessarily a considerable time is required for the restoration of confidence and the renewal of active business enterprises. The telegraphs naturally suffer with other business interests, not so materially in the amount of business done over existing lines, although its effects in that direction have been quite serious, as the disinclination which is created on the part of capitalists to make new investments in telegraphic property. In fact, new enterprises of every description are checked, and for the time most of them suspended or held in abeyance, and are likely to be so for some time to come. The anomalous spectacle is presented of the financial centres of the country suffering from a plethora of funds, while at the same time it is almost impossible to obtain the means required for any new enterprise, however promising it may be. With first class collaterals any amount of money can be obtained on call in this city at the rate of from two to three per cent. per annum, and good business paper is in demand at from five to seven per cent. per annum. At the same time business generally is almost suspended, and probably not one quarter of the business houses are more than paying expenses.

Even speculation in stocks, usually stimulated by an easy money market, drags, and the dealings at the Stock Exchange are only upon the most restricted scale.

It is believed that with the close of the summer there will be a revival of business to a considerable extent, but not upon the scale with which we have been familiar for the last ten or twelve years. The crops promise to be excellent, notwithstanding the drawbacks in some localities from floods, droughts, and the depredations of insects. This will have a tendency to give business a start on the road to recovery which will be beneficial. The moving of the crops will put into active circulation much of the capital which is now seeking temporary investment in this city, and in due time this will put new life into all descriptions of business. A renewal of active and profitable business operations will react favorably upon telegraphic interests, and will eventually create a demand for additional facilities. It is hardly probable, however, that this will come in time to warrant anticipations of any decided improvement during the present year.

Discouraging as has been the condition of business during the past ten months, there is no doubt but that the check, rude as it was, and considerable as has been the damage to some, and suffering of many in consequence, will, in the end, prove beneficial to the country. We were going too fast, and were all living beyond our means, and had the panic been postponed for a year or two longer, the prostration would have been more complete, and the recovery slower than it has been or is likely to be. It has taught the nation to economize, and to realize that we were not in reality as prosperous as was generally supposed.

Of course there is much talk of new telegraphic enterprises, and magnificent schemes, on paper, are agitated; but for the present, at least, these are not likely to amount to much in reality. Wonderful inventions are also announced, destined to revolutionize telegraphic business, and afford the maximum of results with the minimum of means. Some of these inventions, however, will, in time, with proper management, realize to some extent the expectations of those who are interested in them, while others are frauds, and can never amount to anything practically. Of the former, automatic telegraphy is the most valuable, and will vindicate its importance in the future telegraphic history of this country and the world. Its practical development has been retarded by causes which we do not care, at this time, to discuss, but it should, ere this, have made much greater progress towards general introduction than it has done. We are not prepared to concede, as some of its more enthusiastic advocates and promoters have claimed, that it will supersede all other telegraphic systems, but it has sufficient merit and importance to entitle it to a leading position in the telegraphic future. However much it may be officially contemned and ridiculed in quarters where antagonistic interests and prejudices warp the judgment and create hostility, it will, in the end, triumph over all such obstacles, and its legitimate value, as a practical system of rapid telegraphic communication, be established. When this result shall be attained depends largely upon the ability and honesty with which it shall hereafter be managed by those who may have it in charge. It should not longer be delayed, to serve the interests or supposed interests of any party seeking to appropriate honors arising from the labors and inventions of others.

Upon a careful review of the telegraphic situation we see no cause for permanent discouragement. The present depression is but temporary, and will be succeeded, sooner or later, and we are confident at no very distant period, by renewed activity, which shall again bring into active and profitable requisition all the telegraphic skill and talent of the country. Active and vigorous competition in the not very distant future will make telegraphy once more an attractive and remunerative business.

We trust that we may be excused if we urge once more upon the managers of the several companies and

lines competing with the Western Union the vital importance of combining their forces and enterprises, and the adoption of the most reliable and improved telegraphic systems, in order that they may obviate the disadvantages under which they now labor, and be able to compete on something like equal terms. All obstacles to such a consolidation must, sooner or later, be put aside; and, until it is done, it is impossible that entirely satisfactory results can be rendered.

The Necessity for a more Thorough Education of Telegraph Operators.

It always affords us gratification to notice, in the editorial columns of our official contemporary, the *Journal of the Telegraph*, anything which coincides with us in our efforts to elevate and improve the professional status of the telegraphic profession in this country. In the last issue of that paper we find an article in regard to the qualifications and acquirements required of those who aspire to telegraphic positions in some European countries, with very just and sensible comments upon the subject, in connection with the actual proficiency and knowledge of many of the profession here.

It has been urged in THE TELEGRAPHER, from time to time, that the professional telegraphic standard in this country was too low, and that not only the interests of the telegraphers themselves, but also of the employers and the patrons of telegraphic lines, would be advanced by the adoption of some system which would insure the requisite knowledge and ability on the part of those who are employed in the more responsible telegraphic positions. The following extract from the article of our contemporary will illustrate, more forcibly than we could do, the present status of many of those even who are recognized and employed by the Western Union, as well as the other telegraph companies in such positions:

"Now, we do propose that something shall be required of men and women entering the service beyond a clean collar and two fingers of one hand educated in a rude way to dot and dash making. How much knowledge shall be required we will not predict. He must certainly know his telegraphic letters, and make them correctly; he must write a clear hand; he must have a knowledge of circuits and office connections; he must be informed respecting the company's rules. Yet these simple requisitions are objected to. 'I fear,' says the manager of a large office, 'if this were required here, I would be left almost alone.' Another says, 'Don't do it; the extent of ignorance is fearful.' Another writes, 'It is a lamentable fact that very many of our first class operators in large offices are ignorant on the points named.' We ask, can this ignorance of the commonest knowledge of a great business be true? We fear it is."

It is mortifying to those who desire and are laboring for the improvement and elevation of telegraphers, that such a state of things should exist. That it does exist is undisputable.

How the situation is to be changed and improved our contemporary does not point out. That it should be, and as speedily as possible, we presume that no one will question who has the best interests of all concerned at heart. We have repeatedly pointed out the only way in which this improvement may be effected—that is, by the cooperation of telegraph employers and employes. It can only be done by a proper classification of telegraphers and telegraphic situations—a classification which shall be generally recognized by both parties, and which shall be well defined and authenticated. This can be done through the joint action of employers and employes, acting through an organization which shall be encouraged and its objects promoted by the telegraph companies. That such an organization is practicable we have no doubt; but so long as any association of telegraph employes is discouraged by the Western Union Company, under the mistaken idea that it must be inimical to the interests of telegraph employers, we fear that things must go on in the same old way.

The loss and damage which is constantly entailed upon telegraph companies and their patrons by the incompetency and insufficient education of its employes,

in their duties, if prevented by a proper standard of professional acquirement and proficiency, would, if the net amount were saved and divided between the companies and such employés, add materially to the net revenue of both parties. In what other great business enterprise would there be tolerated so many employés, especially those upon whose intelligence and proficiency success so largely depends, who had acquired only the merest rudiments of the knowledge requisite to the proper discharge of duties?

For the present telegraphic *status* of their employés telegraph companies and employers are largely responsible. So long as the only question, or the main one considered in employing telegraphers, is merely at how small a compensation their services can be obtained, we need not expect any material improvement. It seems not to be realized by telegraph employers that low priced service is not always cheap service. When it shall be, and proper encouragement is afforded to those who seek to be something more than mere manipulators of telegraph keys, and readers of telegraphic signals, we may look for the commencement of a new and improved telegraphic condition. But as long as college plugs, and others not better qualified, can easily obtain situations because they are ready to accept them at any rate of compensation which may be offered, there is but little encouragement to those who are calculated to honor the profession, to devote themselves to telegraphic pursuits, and expend the time and study requisite to enable them to become creditable and profitable telegraphic employés.

Now that there are indications that at the headquarters of the great telegraphic organization of the country, which employs many thousands of telegraphers in its service, that these facts are beginning to be appreciated, we have a hope that the time is not very distant when this much needed reform may be realized.

The Summer Passing Away.—Experience and Prospects.

THE summer season is rapidly drawing to an end, and in a few days its record will be closed, and we shall have entered upon what is generally, in this country, the most pleasant and, in some respects, the most satisfactory portion of the year. The crops are being gathered already, and promise to yield abundantly, and however unfortunate and depressed the present year has been in a business point of view, there is no danger now of scarcity of the products of the earth, except in limited sections, from causes specially operating upon certain localities.

Those who have been able to avail themselves of the opportunities for rest and recreation which the season has afforded will be returning to their usual avocations, it is to be hoped, with renewed strength and energy, and improving prospects, so far as business is concerned. The telegraphic fraternity have doubtless enjoyed as much, if not more than usual, the vacations and intermission from labor, for there has been even less than the usual pressure upon the telegraph lines at this season of the year, and by mutual aid and assistance probably most of those who desired it have been able to enjoy the annual vacation which all should have.

Heretofore the columns of THE TELEGRAPHER have been occupied during the spring and summer with communications on the vacation question, but there has been little if any of this the present season. The transition from the old to the new order of things in this respect seems to have been completed, and the policy of the telegraph companies so fully established, that it is considered useless to discuss it further, or to indulge in complaints and repinings in consequence. There has been much to be said on both sides of the question, and although we are still of the opinion that it would be good policy to allow telegraphers, who labor faithfully during the year, an opportunity to rest for a week or two during the summer and early fall, without requiring them to supply a substitute, yet, as

the matter has been finally decided the other way, and those immediately interested have acquiesced in that decision, it is better for all to submit quietly and cheerfully. This has been generally done, and we consider the discussion as practically closed.

With the opening of the fall season we look for a revival of business, and for improving prospects generally. This matter we have more fully discussed in another article, and, therefore, need only allude to it here in passing. The lesson of the past year has been a severe one, and we trust that it may not be necessary that it should be repeated for many years to come. It has taught us frugality and economy, which we had almost forgotten in a seeming but delusive prosperity following the war and the consequent financial inflation. We were generally making money fast—on paper—and spending as a nation much more than we could afford for articles of luxury and for extravagant living. With nations, which are but an aggregation of individuals, pay day must come some time, and however great may be our resources, and apparently profitable our enterprises, if we spend more than we produce, when it does come it is apt, after such experience as we have had during the past few years, to find us unprepared, and to necessitate retrenchment and the practice of a rigid economy, in order to compensate for past extravagance and lay the foundation of a renewed prosperity.

It is useless to regret the past—let us then all go forward cautiously but surely—and when another summer season comes round we may be in a much better condition to enjoy it, and can welcome with renewed and increased zest the relaxation and pleasure which it is calculated to afford.

The Direct United States Cable.

THE steamer Faraday completed the laying of the section of the Direct United States Cable from Nova Scotia to the coast of Newfoundland on the 25th ult., and immediately sailed with her consort, the Ambassador, for England. Upon her arrival there she will take on board the remainder of the cable and proceed to lay it from Ireland, to connect with that already submerged between Newfoundland and the United States.

The Oracle Dumb.

THE official organ of the Western Union Telegraph Company has failed to respond to our request to point out the "device, or combination of devices (other than the condenser) to be found in the differential duplex, as now or heretofore used on the Western Union lines, and which is in any degree essential to the successful daily operation of the instrument in practical business, which was not known or used by others prior to the introduction of the apparatus of Mr. STEARNS in 1868." Having undertaken to retort upon THE TELEGRAPHER and its contributors for the exposition made by our correspondent, "Ontario," in the paper of July 4th, of the absurdity of the attempts made through that paper to claim everything of value in connection with duplex telegraphic inventions for Mr. STEARNS, we supposed that the writer of the editorial article in question would be pleased and gratified at the opportunity afforded to show the grounds upon which such sweeping claims had been made; but, perhaps, upon an investigation of the subject, he found that he had inadvertently put the official organ in an untenable position, and concluded that the less said about it the better.

At any rate, the failure to respond to the request which was made in good faith by us, must be taken as an admission that we were right in the matter, and that there is nothing to be said in explanation or justification of the extravagant claims of the *Journal of the Telegraph* on behalf of Mr. STEARNS, and indirectly of the Western Union Company, which is the owner by purchase of Mr. STEARNS' duplex patents in this country. It will be remembered that the *Journal* even went so far as to claim for Mr. STEARNS a device

which he described in his patent of 1868, and expressly disclaimed, as belonging to Messrs. SIEMENS and HALSKE, of Berlin.

If the official organ can afford to let the matter rest where it is we certainly are content, and we have no doubt but that our readers will fully appreciate the wisdom of such an ignoring of it, rather than the pursuit of the less disingenuous if more candid policy involved in an acknowledgment of error.

The Wheatstone Automatic and the Western Union Telegraph Company.

It is rather late in the day for an attempt being made to introduce the WHEATSTONE automatic system in this country, when there is already in daily practical business operation here a much more rapid and reliable automatic system; but this, we understand, is the latest enterprise of the managers of the W. U. Telegraph Company. A pair of WHEATSTONE instruments and punchers have been imported, and are now being experimented with at 145 Broadway, with a view to their introduction upon the lines of that company. This fact causes considerable amusement in telegraphic circles, in view of what is known of the capacity of the WHEATSTONE apparatus as regards speed, and the length of circuit which can be worked with it.

What has become of the wonderful quadruplex arrangement which, according to Mr. ORTON, was to solve all the difficulties which threatened the telegraph in the future? That remarkable production of inventive genius seems to have sunk into a sudden obscurity, and to have been abandoned for the WHEATSTONE. If what was so confidently asserted in Western Union official quarters, in regard to the quadruplex, had any actual foundation in fact, it certainly would excel the WHEATSTONE in performance two to one. But perhaps the genius which reinvented the quadruplex is to be applied to quadruplexing the WHEATSTONE, which, if successful, would increase its capacity to 240 words per minute—not a very remarkable performance, it is true, beside the authenticated achievements of the American automatic system, but much better than our Western Union friends have ever succeeded in doing heretofore. We should like to see the quadruplex WHEATSTONE automatic system in operation, and trust that when it is we may be permitted to witness and report upon its performance. We guarantee that our report shall be truthful, which is more than can be said of recent statements of others in regard to certain remarkable inventions which were expected to revolutionize telegraphy in this country.

Personals.

Mr. G. A. TAYLOR has resigned the Oakland, Oregon, office of the O. & C. R. R. and accepted a position with the Western Union Co. at Yreka, Cal., repeating office, vice — PECK, resigned.

Mr. G. Q. STEWART has been appointed manager of the Yreka, Cal., W. U. repeating office, vice Mr. J. WALDO THOMPSON, transferred to the San Diego, Cal., office of the same company.

Mr. CHAS. FRASER, formerly operator for the Great Western Railway at Merriton, Canada, has been appointed agent of the Montreal Telegraph Co. at Galt, Ontario, Canada.

Mr. J. H. WOODRUM has been appointed agent and operator at Oakland, Oregon, O. & C. R. R. line.

The Telegraph.

Foreign Telegraphic Notes.

A TELEGRAM, under date Bombay, June 29, states that Schwendler's system of duplex telegraphy over a single line is working satisfactorily between Bombay and Calcutta.

A deputation from the Anglo-American Telegraph Company, consisting of Lord Monck, Captain A. T. Hamilton, Sir D. Gooch, M. P., Mr. Cyrus W. Field, Mr. F. A. Bovan, Mr. W. Barber, Mr. C. Burt, Mr. H. Weaver and Lord William Hay, has had an interview with the Earl of Carnarvon, at the Colonial office, in reference to the company's claims to exclusive rights to lay cables between Ireland and Newfoundland.

Time Telegraph of the Reading Railroad Co.

THE manner of giving the correct standard time of the Philadelphia and Reading Railroad Company to all its telegraph stations, 255 in number, along the main road and all its branches, is as follows: At three minutes to 4 o'clock P. M., daily, except Sunday, all business along the lines is suspended; and by means of a series of repeaters all the lines of this company, 36 in number, are arranged so as to be operated and controlled by one operator at the Reading office, who has a chronometer before him, from which the correct time is given. Commencing at three minutes to 4 P. M., the Reading operator says "time" on the lines, which calls the attention of all operators to adjust their clocks, and is continued at short intervals until five seconds to 4, when he opens the circuit. At 4 o'clock he makes one tap; at fifteen seconds after 4, two taps; at thirty seconds after 4, three taps; at forty-five seconds after 4, four taps; and at one minute after 4, five taps. By this arrangement every telegraph station is able to get the correct time to the second, daily, and thereby have the railroad clocks and watches of the employes properly adjusted, which is a very important matter in the management of a railroad.

A Good Education.

THE late Edward Everett condensed into a single brief paragraph his estimation of what constituted a good education. Here it is: "To read the English language well, to write with despatch a neat, legible hand, and be master of the four first rules of arithmetic, so as to dispose of at once, with accuracy, every question of figures which comes up in practice. I call this a good education. And if you add the ability to write pure, grammatical English, I regard it as an excellent education. These are the tools. You can do much with them, but you are hopeless without them. They are the foundation; and unless you begin with these, not with flashy attainments, a little geology, and all other ologies and ophies are ostentatious rubbish."

THE Great Western Telegraph Company are fortunate in their selection of an operator in this city. There is no more expert manipulator of the keys, or accurate recorder of despatches, than Dan Farrell, Jr., and our thanks are due for the promptness with which our despatches are always delivered and the correctness which characterizes them.—*Galesburg (Ill.) Republican-Register.*

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

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JULY.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
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5	74 1/2 75%

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended July 7, 1874, and bearing that date.

152,772.—ELECTRO-MAGNETIC MOTORS.—W. S. Sims, New York, N. Y. (Filed Mar. 17, 1873.)

The magnets and armatures of an electro-magnetic motor are serrated across their polar faces, the revolving magnets approaching the stationary armatures in a direction parallel to the serrations, the promiunces of each extending into the depressions of the others.

The combination, in an electro-motor, of an electro-magnet, the polar face of which is grooved or serrated, with a polarized or unpolarized armature, correspondingly grooved or serrated, the one being arranged to approach the other in the direction of their grooves or notches across their polar faces, as and for the purpose specified.

For the week ending July 14, 1874, and bearing that date.

153,063.—ELECTRIC TELEGRAPHS.—Theodore M. Foote and Chas. A. Randall, New York, N. Y. (Filed June 27, 1874.)

1. The combination of the armature a, provided with a polarizing helix or helices, M1 and the electro-magnets M2, having electrical circuit connections, as described, and arranged to act upon said armature, substantially in the manner and for the purpose set forth.

2. The combination of the electro-magnets M2, provided with the extended cores c c', the electro-magnets M1, and helix M', the helix M' being arranged transversely to the magnets M2 and

between the cores c c', substantially as and for the purpose described.

3. The method of transmitting electrical signals, the same consisting in sending over the lines regularly alternating currents of opposite polarity and of equal duration, the dots and dashes being distinguished by the space left after the transmission of any single impulse, substantially as and for the purpose described.

4. A fillet of paper perforated for telegraphic transmission in two rows, each row serving to transmit currents of a polarity opposite to those transmitted by the other row, the perforations in both rows being of equal size, and in each row intervening between those in the other row, substantially as described, and for the purpose set forth.

153,064.—ELECTRIC TELEGRAPHS.—Theodore M. Foote and Chas. A. Randall, New York, N. Y. (Filed June 26, 1874.)

1. The fillet of paper for direct recording chemical telegraphs, provided with the extra row of perforations, the perforations in the extra row coming directly after each and every perforation in the row or rows corresponding to the message, as set forth.

2. The fillet of paper perforated with an extra row of perforations between each and every perforation in the row or rows corresponding to the message, in combination with an extra pen or stylus, connected to pole of battery opposite to the recording battery, for the purpose of discharging or freeing a telegraph line or cable of an unavailable or surplus electricity, as set forth.

3. The fillet of paper, perforated with an extra row of perforations between each and every perforation in the row or rows corresponding to the message, in combination with an extra pen or stylus, connected to earth, for the purpose of discharging or freeing a telegraph line or cable of unavailable and surplus electricity, as set forth.

4. A fillet of paper, perforated with an extra row of perforations, in combination with an extra pen or stylus, connected to earth, and a discharging or extra battery at the receiving end of a line, for the purpose of discharging or freeing a telegraph line or cable of unavailable and surplus electricity, as set forth.

5. The method of working automatic or chemical telegraphs, consisting in the transmission of alternating currents of opposite polarities, one current effecting the recording, the other acting as a discharging or freeing current, and being thrown upon the line immediately after each break in the circuit of the recording current, substantially as described, and for the purpose specified.

6. In automatic or chemical telegraphs, the method of obviating tailings or blurs, and of effecting a ready discharge or freeing of the line, the same consisting in throwing upon the line immediately upon each and every break in the circuit of the recording current a current of opposite polarity, substantially as and for the purpose specified.

7. The combination, with the transmitting drum, of a recording and receiving drum and circuits connecting them and the line, the transmitted current being thereby thrown through the recording drum, and a copy of the message sent taken, substantially as and for the purpose described.

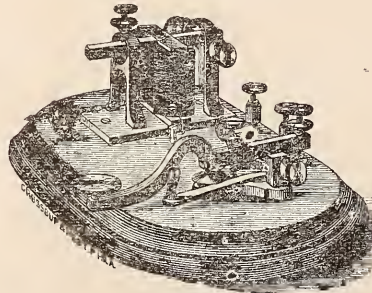
8. The combination, with the motive power driving the receiving and transmitting drums of an automatic telegraph apparatus, of an adjustable governor, substantially as and for the purpose specified.

9. The combination, with the transmitting drum of an automatic or chemical apparatus, of two or more styluses, insulated from each other, and connected to opposite battery poles, substantially as and for the purpose specified.

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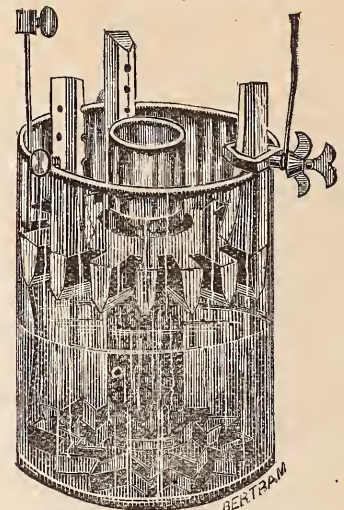
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For closed circuit it is without a rival.

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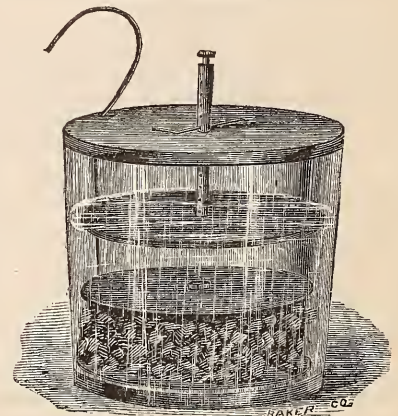
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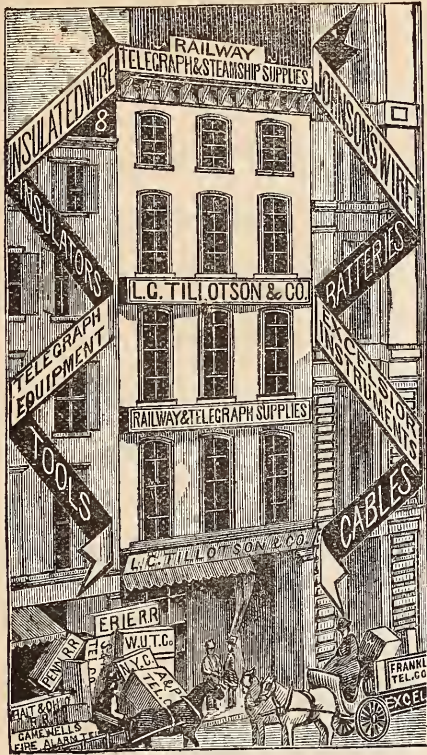
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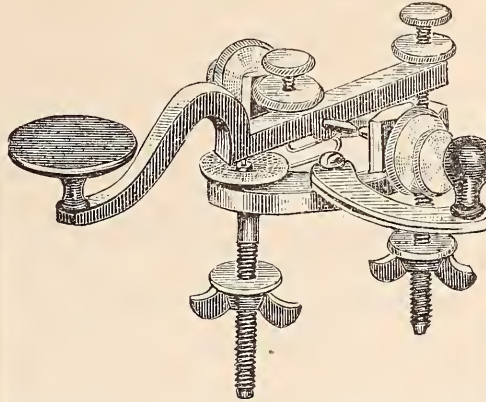
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Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit
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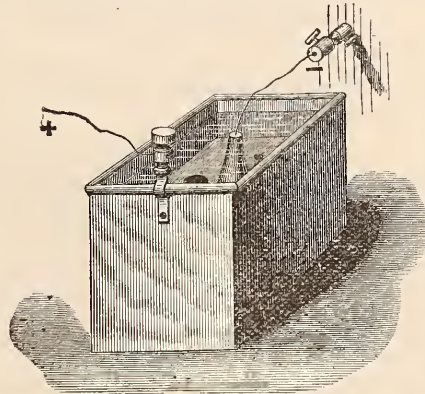
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AND THE

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A REVISE AND ENLARGEMENT OF THE
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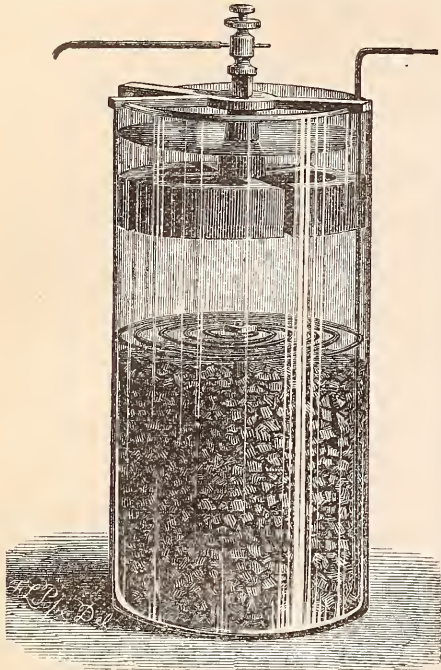
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As the work progresses further notice will be given.

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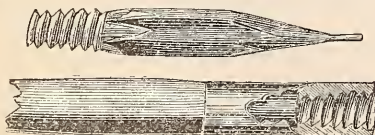
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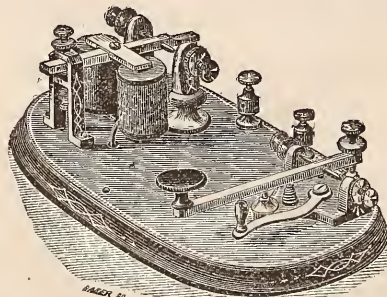
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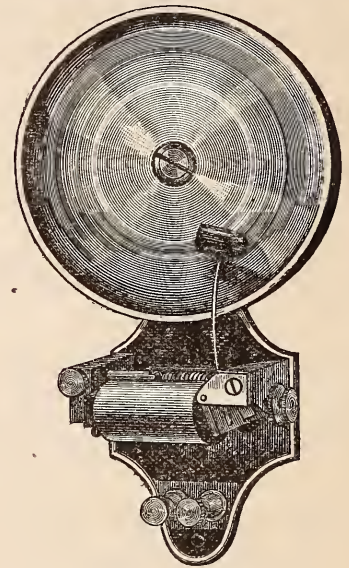
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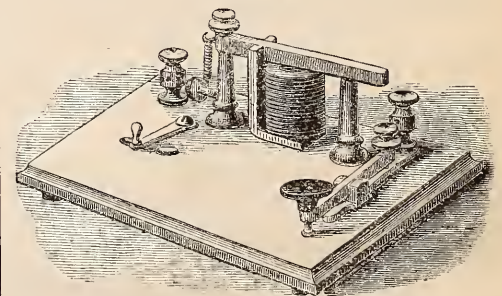
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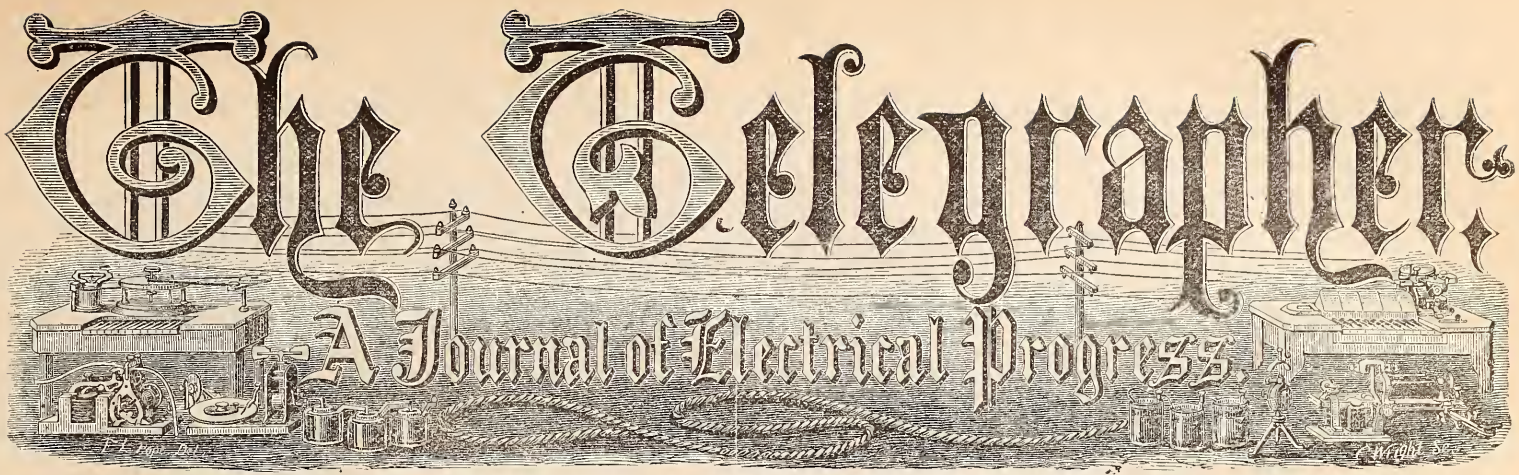
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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, August 15, 1874. Whole No. 422

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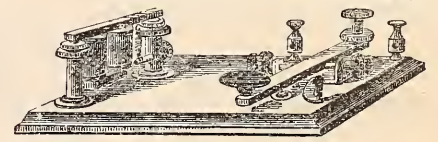
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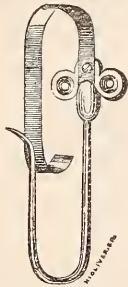
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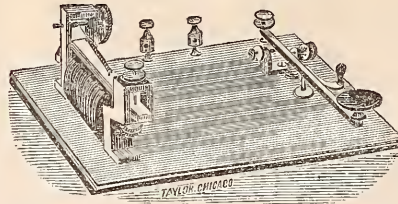
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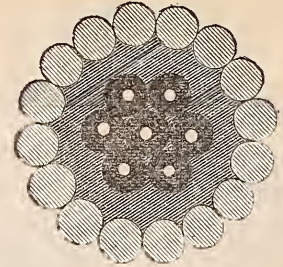
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THE TELEGRAPHER

A JOURNAL OF
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SATURDAY, AUGUST 15, 1874.

VOL. X.

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Original Article.

The Necessity for a More Thorough Training and Education of Telegraphers.

THE coöperation indicated in the editorial article which appeared in the last number of THE TELEGRAPHER between the official organ of the Western Union Telegraph Company and the former, on the important subject of a more thorough training and education for telegraphic employes in this country, is encouraging. The importance of the subject will warrant much more earnest attention and consideration than it has yet received, and it is to be hoped that it will not be suffered to pass out of mind and notice again until something tangible and permanent towards a reform in this respect has been accomplished.

This subject should be agitated and discussed not so much because it is for the interest of the employers and the patrons of the line, although these must not be overlooked, as in that of the employes themselves. It is one of the most discouraging features of the telegraphic situation to-day that really so little interest is taken, and so little actual importance attached to the subject in which all are so vitally interested, whether telegraphic employers or employes. There is really no standard of ability and acquirement in this country to distinguish between the really competent first class employes—those who are qualified to discharge intelligently the higher and more important duties of telegraphic service and those whose qualifications enable them to perform properly only the mere mechanical and subordinate duties. There is, in fact, no classification of either the telegraphic situations or the employes except an uncertain and undefined one that has grown up haphazard through customs which vary with every telegraph line and company. That such a state of things in so important a profession and business should exist is and must be a matter of surprise to any one who will reflect upon it.

It is a mistaken idea of economy on the part of telegraphic employers that leads to the bestowing of situations upon individuals because they are willing to serve for a few dollars less per month than are others, without proper regard to their qualification and ability. It is a very damaging error to allow telegraphic appointments to be made through personal favoritism. There is, in fact, no business done in which "civil service reform" is more imperatively needed than in that of the telegraph. It is also a very serious error on the part of telegraph employes to oppose either actively or through indifference such an improvement in this respect as has been indicated in the articles to which reference has been made, and in others of a similar character which have preceded them. The status of those who realize the importance of the telegraphic service and the necessity which exists that the qualifications and acquirements requisite to a proper understanding and discharge of telegraphic duties should be clearly established and defined, is lowered and impaired, through the carelessness, indifference and disregard thereto, which almost universally prevails.

As has already been well said, the reform can only be accomplished by the joint and united action of telegraph managers and employers and telegraph employes. That it must be effected eventually would seem to be indisputable, but it must be acknowledged very little progress has been made towards it as yet. It has failed to secure the support of telegraph employers through anticipation that it would, perhaps, add to the actual current expenditure for carrying on the business. This objection would be found of little, if any, force in actual practice. It is not so much that the aggregate amount paid for telegraphic service is too small as that it is not properly apportioned. Some telegraphers are unquestionably paid more than their ability, natural or acquired, entitle them to, and occupy situations for which they are not properly fitted, while others are paid less, and not infrequently are assigned to and compelled to accept situations and compensation inferior to what should be accorded if these were properly classified and assigned. Another reason why the support of telegraph managers and employers is not cordially given to such a reform is that they fear the result of encouraging an organization of telegraph employes,

not seeing that the true policy is to encourage and aid their employes in organizing and maintaining an association which shall be national in its character, and which should represent and speak for the employes, in establishing such reforms and regulations as shall be for the benefit of all parties. As it is at present, there is no one who can speak for more than one individual, and united and effective action is impossible. It is not necessary that such an association should be similar in its character and purposes to the Telegraphers' League, which is the bugbear that creates hostility on the part of employers, or that it should be of the nature of a Trade Union, dictating to and attempting to coerce by mere force of numbers and combination the employers to its behests. The telegraphic fraternity should be composed of so intelligent a class, and possess such a moral weight, as to secure all necessary and advisable reforms without resorting to the tyranny which has at times characterized what are known as Labor Associations or Trades' Unions. They should occupy a position somewhat in advance of the hod carriers or bricklayers of the country, and should rely upon something more and higher than brute force or compulsion to accomplish their objects. It is not anticipated by anybody that another Telegraphers' League, or another telegraphers' strike will be likely to occur among the present generation of telegraphers, and therefore the fears and apprehensions of telegraph employers which have been alluded to are groundless and should not be allowed to stand in the way of needed reforms.

Until there is a very general improvement in the training and education of telegraph operators the best results can never be attained on any line or by any company. It is probably no exaggeration to say that in no other business or profession requiring special education and training, is there so little regard paid to the proper qualification of those who are employed in it. Matters of the greatest importance, involving very often not only fortune but life even, are recklessly and unthinkingly intrusted to employes who have but the rudiments, and sometimes not even these, of the knowledge and practice requisite for the assured proper discharge of their duties. If no mistake is made, or no accident happens, it is more through good fortune and good luck than otherwise. The columns of THE TELEGRAPHER about every week contain accounts of more or less "bulls" perpetrated by telegraphers, but these are invariably of the more harmless and amusing kind; of the more serious ones and those which result disastrously very little is ever seen in print. That they are numerous, every telegraph manager and every telegraph operator of any considerable experience well knows. That most of them would be avoided and prevented by a more thorough training and education of the telegraph operators cannot be questioned. The amount of business that can be transacted over one wire equipped with only really good operators would astonish one who has had experience on one worked in the usual way, mostly by operators not remarkable for their qualifications. It is the telegraphers who are efficient and reliable, and who have aspirations above the mere manipulation and translation of dots and dashes that make the telegraph as peculiarly successful as it is. It is they who keep up even to its present standard the reputation of a profession which should stand as high as either the learned professions, so-called, in the estimation of the public.

That the time may soon come when the number of these shall be increased, and when they shall comprise the majority instead of the minority of those who are known and recognized as telegraphers, we should all desire. This subject might be pursued, and, perhaps, profitably, to a much greater length, but as much has been said as the readers of THE TELEGRAPHER can bear at this time, I will close with the expression of the hope that we may hear through its columns from others who desire the elevation of the telegraphic fraternity, and have at heart a just pride in its achieving a reputation and standing, to which, properly trained and educated, it would be fully and cheerfully accorded.

The Rapid Development of the Electric Telegraph Business.

A FEW days ago a telegraphic despatch from Maine announced the decease in that State of Mr. G. E. Smith, who constructed for Professor Morse the forty miles of magnetic telegraph from Washington City to Baltimore, which constituted the original of the vast system of telegraphs now extended throughout the world. That line was completed for use in the last week in May, 1844—the first news despatched having been sent over the wire on the 29th of May. The quite recent death of the constructor of that line naturally carries the mind backward over the thirty years of existence of the magnetic telegraph, and brings into bold view the feeble beginning of the marvelous progress of this peculiarly American work. After the patient but persistent efforts of Professor Morse for several years, Congress, in 1843, made an appropriation of \$30,000 for

an experiment with the Morse telegraph between Washington City and Baltimore, and it was this line that was completed in the spring of the following year. The money, grudgingly granted in the midst of scoffs, and jeers, and references to "animal magnetism, etc.," has been frequently referred to as a munificent gift in the interest of science and the diffusion of intelligence. Perhaps it was, but it may serve at once to illustrate the magnitude of the growth of the telegraph, and how greatly the government profited by its generosity, to say that quite recently, within a period of five years, the Western Union Telegraph Company alone paid to the Treasury in taxes \$850,000, and in gold duties on imports of telegraphic wire \$328,000 more. Thus the investment of that \$30,000 repaid itself in those two items alone, in those five years alone, and from one company alone, more than thirty fold.

Going back to the forty miles of wire between Washington and Baltimore, which measured the whole dimensions of the magnetic telegraph this day thirty years ago, we are better able to appreciate the two hundred thousand miles of wire which form the immense network of the telegraph over the United States to-day. Of these two hundred thousand miles of American wires, which would encircle the globe more than eight times, about one hundred and seventy thousand belong to one company. In June, 1844, there were two operators at work; in June, 1873, there were nine thousand nine hundred and thirty persons employed by one American company, and about twelve thousand by all the American companies. In this exhibit of the growth of thirty years we limit the figures to the statistics of our own country, leaving the Old World out of view altogether.

In some other respects the change wrought by the telegraph in less than the period of one generation is still more striking. It requires no strain upon the memories of even the junior partners of some of our old business houses and offices to recall the anxious times when they were more or less at the mercy of sordid and active men who used carrier pigeons, relays of fast horses with their hardy express riders, semaphore signals from hill top to hill top and along the coast, and other similar expedients for getting advance news of important events, with all the resulting advantages. In those days fluctuations in the prices of commodities in the great markets of the world were frequently secrets known only to a few, who sold their knowledge to another few, and thus a small knot of men in every commercial centre were enabled to buy the property of their uninformed neighbors for far less than its value, or sell their own for far more than its value. Now all business men get their information simultaneously, and, if they wish it, they can get it from all the markets and money centres of the world. The merchant at our Commercial Exchange is in immediate communication with corn, cattle, cotton, produce, shipping and commercial exchanges everywhere in our own country and abroad. The banker on Third street has his wire extending from his office to New York, Chicago, San Francisco, New Orleans, London, Paris, Frankfurt, Berlin, Amsterdam, Constantinople, Bombay, Calcutta, Rio Janeiro and Shanghai, and all cities and countries between. He sits there with instant knowledge of the financial, commercial, political, and other important current events of Europe, Asia, Africa, Australia, the East and West Indies, and South America, as well as of his own country. The telegraph, the Associated Press, and the newspapers within that organization concentrate this universal intelligence, and lay it before the whole public simultaneously at least twice every day; and all this marvellous change and vast and wonderful system that has brought it about is, as the decease of the builder of the pioneer line sharply reminds us, the growth of but thirty years.—*Public Ledger*.

Delay in Laying Submarine Cables.

AT the meeting of the Telegraph Construction and Maintenance Company a vote of thanks, as well timed as it was merited, was awarded to the officers and staff of the company. Every neophyte on the London Press starts with the idea that he is thoroughly competent to write a leading article or a dramatic criticism, and there are men like them, and like them mistaken, who consider the laying of a submarine cable the mere A B C of practical engineering. Those who entertain that idea we would advise to ponder well upon the fact that the Faraday, out since the 16th of May last, has not yet—so far as can be ascertained—succeeded in laying more than 400 miles of cable in shallow water.

We learn also that there will be some delay and disappointment with respect to the completion of the Central American cable, which was taken out by the steamship Hooper. A circular, issued last night by the directors of the West India and Panama Company, states that faults of so serious a character have developed themselves in their cable that the Hooper is on her return home to have the entire cable overhauled. It is further stated that there is a fault in the cable

which has already been laid from Para to Cayenne, so that the laying of the line on behalf of the Central American Company must be delayed for some months. To this may be added the further disappointment caused by the wreck of the Gomos in attempting to lay the River Plate cable by Messrs. Siemens, who are also the contractors for the Direct United States Cable Company.

The following is the circular of the West India and Panama Company above referred to:

"SIR—I am instructed to forward for your information the following copies of communications which have been received from the Central American Telegraph Company. The line between Para and Cayenne has been laid, and is in working order, but a fault is stated to exist on it about 109 miles from Para. This fault is in shallow water, and the steamship Great Northern is already ordered to the spot to effect the repairs. It will be borne in mind that by the terms of the contract no payment becomes due to the Central American Company in respect of either of the sections, Para to Demerara or Trinidad to Porto Rico, until its final completion and maintenance in perfect working order for thirty days have been certified to this company by Sir William Thomson or Professor Jenkin. I am, sir, your obedient servant, CONSTANTINE M. HOOKER, secretary."

Mr. Hooper, the managing director of Hooper's Telegraph Company, says:

"DEAR SIR—I have received a communication from Mr. France, our engineer-in-chief on board the Hooper, intimating that a portion of the cable intended for Cayenne, Demerara section, is faulty. I have no doubt but that the faults are merely mechanical, however occasioned, and although I believe they could be cut out at Para, yet, rather than run any risk whatever, I have sent instructions for the ship to return home, when a thorough investigation of the facts and a complete inspection of the cable may be made at our works. The cable will be sent out again with the remaining section in October, so that the completion of the contract, as a whole, will not be delayed.—Faithfully yours, W. HOOPER, managing director."—*The Railway News.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

New Telegraph Projects in Oregon.

ALBANY, OREGON, July 27.

TO THE EDITOR OF THE TELEGRAPHER.

THE citizens of Astoria, Oregon, are now getting in earnest about the construction of the telegraph line from Portland to that point.

A line from Cornelius, on the Oregon Central R. R., to Astoria, a distance of ninety miles, is estimated to cost \$8,000, but the shorter and more feasible route, from Cowlitz to Astoria, is a distance of but fifty to sixty miles with a cable. From one and a half to two miles of cable would be required; allowing \$1,500 for a cable across the Columbia at Oakpoint, the cost of putting Astoria in telegraphic communication with Portland *via* Cowlitz, and the through line at the latter point, would be about \$6,500; surely a good investment, if only for the purpose of reporting the movements of the shipping up and down the river. As it has been and is yet, there is no chance to hear of a vessel by telegraph from the time she leaves San Francisco till she gets to Martin's Bluff, about sixty miles below Portland, and yesterday official notice was received of the closing of the office at the Bluff, so that the only show now is when they pass Kalama, W. T.

Quite a good local business could be inaugurated between Astoria, Portland, and the fifteen or twenty larger salmon fisheries between Astoria and Kalama.

It is proposed to incorporate a stock company, of \$10,000 capital, and put the line through this fall. Citizens of Astoria, proprietors of the larger fisheries, have signified their willingness to take stock in the enterprise, and it is stated that Col. Gamble, General Superintendent of the W. U. Telegraph, has proposed to take \$2,000 stock if the company should be formed, as also the Salem Flouring Mills Co., who are getting to be our heaviest exporters to Liverpool and other "foreign latitudes." It is to be hoped this will be pushed vigorously now till completed.

The new wire being built by the W. U. Telegraph Co. from Roseburg is now finished as far as Jacksonville, Oregon, about one hundred and twenty miles from Roseburg, and it is being pushed as rapidly as possible. It is proposed to have a new line built from Roseburg to Coos Bay, a distance of some sixty miles, this fall if possible, and connect at the former place with the through San Francisco wire. This will be another "good thing," as there is considerable shipping now between Coos Bay and San Francisco, and every

year the business of the different coal mines and the lumber trade is increasing rapidly. Weather fine and beautiful with us, and the nights—oh, bless 'em—splendid for sleep, a blanket and sheet just right for covers. You poor mortals in the East have our sincere sympathy in your trials with "hot" weather. If you want a *paradise*, "go West," but don't come expecting a telegraph "sit;" they are mighty scarce, and, like Irishmen's fleas, when you think you have 'em it ain't there. Only one good thing, jobs are generally permanent if a fellow keeps sober and don't run the Oregon gals too much; these two things bust any one.

WEBFOOT.

Double Duplex and Quadruple Telegraph.

BENTON STATION, KENTON Co., Ky., Aug. 7.

TO THE EDITOR OF THE TELEGRAPHER.

MY attention has been called to recent notices of an invention answering to the above cognomen. I feel interested in the matter, because I, too, have invented, *some time since*, an instrument answering to the above call. I will here refer you to the file of the *Journal of the Telegraph*, 1871 or 2, to the various articles between the editor and myself on the subject. My invention consisted of the use of two polarized relays and a Morse relay; one of the relays was actuated only by the current from the negative end of the battery, and the other by the positive—the battery being divided. The Morse relay was used to actuate both sounders simultaneously; so that a dot struck on the right hand key would make a dot on the right sounder through the right polarized relay; the left key worked the left sounder through the left polarized relay. An *increased* current only moved the Morse relay, for it was kept open by the spring when the lesser currents were used. Thus *each sounder* responded to *each key* whether separate or simultaneous. I wrote to Mr. Prescott in regard to the feat of actuating *two sounders* on one wire, and he said it was an ingenious invention, but of no practical value.* In a short time I improved by converting my three relays into one relay, calling it a *triple relay*, because it possessed the principle of the two polarized and the Morse combined. I exhibited my instruments last year in the Cincinnati Exposition. Some correspondent, unknown to me, noticed the fact to the editor of THE TELEGRAPHER, and you published it last fall. I had no one to help me in the above inventions. After I invented the above *polarized triple relay* I was assisted very much by reading Mr. Frank Pope's valuable work, especially on the duplex (pages 104-5-6-7, 1870). I studied over the matter, and found to my great satisfaction that by wrapping my *triple relay* with two wires, according to the Siemens & Halske plan, that it would make a double duplex.

I would be glad to give you diagrams representing my sounding keys, reverser and repeater, having it all complete and in working order. So that there is nothing more to do but to apply it to the many wires that need help, and let its influence be exerted for the good of mankind in bringing us closer together in the bonds of friendship, love and truth.

H. C. NICHOLSON, M. D.

Telegraph Schools and their Victims.—Insufficient Education of Telegraphers.

TO THE EDITOR OF THE TELEGRAPHER.

THERE are some things "no feller can find out," as Dundreary has so persistently informed us, and one of these is, what becomes of the majority of the victims of the numerous "telegraph colleges," "institutes," etc. It is true that occasionally one of them turns up on a telegraph line, only to ascertain, however, that the time and money invested in the attempt to learn what, generally, the pretended teachers are incompetent to impart, has been merely wasted. Most of them, however, are never heard of afterwards in telegraphic circles. It would be strange that these so-called telegraph schools should succeed in obtaining so considerable a supply of victims, were it not for the fact that they are generally boys and girls from the country, who have no acquaintance with practical telegraphers, and who are led to believe, by the statements in the lying circulars of the managers, that there is a scarcity of telegraphic labor, and situations are eagerly awaiting them as soon as they have mastered the manipulation of the key, and acquired the requisite knowledge, which they are assured can easily be done in from four to eight weeks. It is useless to waste space in THE TELEGRAPHER in warning such persons against the pretensions of these fellows, because they never see or know anything about the paper. Every telegrapher, however, should warn those who are likely to be inveigled and deceived in this manner against spending time or money in the useless effort to become

* I also wrote to him, Mr. Prescott, in regard to my *triple relay*. I suppose then his duplex system has no triple relay in it. If it has he is trampling on my toes, provided it is a polarized relay actuated by a negative, positive and increased current.—H. C. N.

practical telegraphers without previous training on a regular telegraph line. If they would do this they might reduce the patronage of such concerns, and *perhaps* the so-called teachers might thereby be induced or forced to engage in some *honest* method of obtaining their provender and whiskey.

Another thing, which has always seemed beyond comprehension to me, has been the fact that so large a proportion of those who aspire to telegraphic employment, and not a few of those who are actually engaged in telegraphic service, should be content with a knowledge of the merely mechanical duties of the profession. Of those who are now engaged in telegraphic employment, how large a proportion know nothing of the business beyond the mere manipulation of the key and the reading of telegraphic signals. Of everything besides this they are profoundly ignorant. They know nothing of electric circuits; of the laws which govern electric currents; of the nature and relative value of batteries, or of the manner in which they are made up; of the proper insulation or resistance of wires; of the requisite proportions of resistance in magnets, etc. When any disarrangement or changes occur on the circuits which they work they are utterly incapable of testing or determining their character or of remedying them. They are, in fact, helpless, until some circuit manager or chief operator is at hand to set them right. Such telegraphers are unworthy the name, and when their places can be supplied with more competent and better informed persons they should stand little chance of employment on respectable telegraph lines. It should be the desire and ambition of every telegrapher to become as thoroughly informed as possible in regard to all the branches of the business. It is not by any means necessary that they should aspire to be expert and trained electricians, but they should know enough to take the management of a circuit under any ordinary conditions, and act promptly and intelligently in remedying any difficulties that may arise, which do not require more than an ordinary acquaintance with the principles which govern electrical conductivity and transmission.

There are several other matters which have caused me to reflect seriously upon the defects in the training of telegraphers, but I have occupied sufficient space for this time. If this should be deemed worthy of space in THE TELEGRAPHER your readers may at some future time hear again from

A. H.

Ghosts and Gunpowder.

CALIFORNIA, July 24.

TO THE EDITOR OF THE TELEGRAPHER.

IN 187- A. J. T. was a "burner of the midnight oil" at "Sm." He was a "fancy duck," with blonde hair, and could "frite gerse" with any of 'em, at least he thought so; and he prided himself on being able to win the affections of any young lady he wished.

There was a handsome and accomplished young lady visiting some friends in the neighborhood of T.'s residence, and he became desperately enamored, and, being promoted to agent and operator by the decease of that party, he could hardly find soil enough to tread on. Another young man stood very high in the young lady's estimation, and, as a natural consequence, a jealous feeling arose between them. Each determined to outwit the other. The "lightning manipulator" was a very nervous, timid young man, while the gay engineer was brave and determined. Accordingly, the "steam jammer" employed a third party to assist him. T. was very fond of gunning, so "Nibs" proposed to him to go to the lake, about a third of a mile distant, and shoot some ducks. Nibs loaded, and, of course, carried the gun. When about two thirds of the distance had been travelled two white figures suddenly appeared on a large rock by the roadside. The two stood as if petrified. Suddenly Nibs gave a shriek equal to a steam whistle, and fled toward the hotel, taking care to take the gun, for fear T.'s nerves might be strung to a higher tension than usual by the unearthly appearance of the "steam jammer" and his companion. After Nibs fled T. still gazed at the two figures for some moments; then he called, "Johnny! oh, Johnny!" (that was the deceased agent's given name) "you can have your shirt. I did not mean to keep it. It got mixed with my washing." No response from the supposed ghost, and he turned and fled, overtaking Nibs in about half a mile; he never stopped until he reached the house. Nibs could hardly tell if it was T. or a large bird, he passed so rapidly.

Reaching the house he called for some of Jim's "corn juice" and told his terrible experience. A party was organized to go and interview the ghosts. Of course none could be found, and as the effect upon his mind was all that was required, they tried to lay the vision to nervousness. Some more corn juice, and he was prevailed upon to go to bed. Nibs must sleep with him—he would not sleep alone. They retired, and after getting into bed they left the candle burning. A small hole had been drilled into the candle close to the wick, and a charge of powder put in and nicely

fixed so as to ignite and blow the flame out unceremoniously. Nibs was telling him he had heard of ghosts blowing out the lights, when s-h-h-oot! went the candle. Up he jumped and rushed through the hall, down stairs, and into the bar room, minus pants, etc., This was too much for human nature. He could not be left alone for a moment, for fear a "vision" would join him. The impressio made upon his mind came near proving a lasting one, and it was not until some weeks after he resigned and left the office that he could be made to believe it was a "put up job." It is needless to say the field was clear, and the "steam jammer" had no further trouble getting the "gal."

WILL HONEYCOMB.

How Some Things are Done in the U. S. Patent Office.

TO THE EDITOR OF THE TELEGRAPHER.

HAVE some of the Examiners in the United States Patent Office been keeping company with "Rip Van Winkle," or has our much respected Commissioner of Patents been imposed upon in consequence of the inadvertence or oversight of some of the Examiners in the office under his control? I have some forty-three United States patents in my possession relative to my American system of automatic telegraphy—many of which I find, and I have been advised, that I am legally entitled to reissue for additional claims based upon what is plainly set forth in the said specifications. That being the fact, I am somewhat curious to know why a party by name *F.* and *R.* should, in about seventeen days from the date of their application for a patent, be allowed (what to them must prove to be) old and well known claims, and which is "notoriously patent" to the whole scientific world, belongs to myself. Many of my applications laid in the U. S. Patent Office nearly six months before being acted upon, and very properly so; otherwise, I fail to see how searches could be made by the Examiner by reference to all specifications bearing on the subject rendered during the last "thirty years."

Now, as I (as one of the pioneers of this one of the marvels of science, the electric telegraph,) am somewhat of a walking magazine on such matters, I would like to excite the curiosity of your many readers by putting in type the following "My Duplex Review" of this very recent and very unaccountable proceeding in our model Patent Office.

By exciting the curiosity of your readers, don't yourself be carried away with the idea that I am or that I feel any way hurt (or, as that model of honesty, Abraham Lincoln, would have it, there is nobody hurt) by such proceedings. On the contrary I feel very much pleased to see the strength of my patents enhanced exceedingly thereby. I am the more pleased, because I happen to be one who has worked hard for the good of the many.

GEORGE LITTLE, C. E.

Passaic City, New Jersey. U. S. A., August 10, 1874.

"MY DUPLEX REVIEW."

"G. L. CLAIMS."

"Patent," April 9, 1872.

Dots and dashes may be indicated by a blank or interruption instead of by a colored dot or dash.

"Patent," July 23, 1872.

The recording device brought into action by means of perforations in one line, and the action arrested by the other line of perforations by currents of different polarity.

"Patent," Oct. 18, 1870.

The perforated paper itself the means for operating the extra or "neutralizing circuit."

"Patent," Feb. 26, 1873.

"Plants' condenser or secondary battery," is preferable for this purpose, or the condenser or accumulator as in application dated Oct. 1, 1872.

"Patent," Oct. 18, 1870.

Automatic chemical telegraph, two currents act in opposition to each other and neutralize the action of that which make the mark at the receiving end of the line. The perforated paper itself being the only means for operating the recording and the "discharging, or freeing circuit."

"F. & R. CLAIMS."

"Patent," July 14, 1874.

Dots and dashes distinguished by the space left.

"July 14, 1874."

A fillet of paper perforated in two rows each, serving to transmit currents of opposite polarity.

"July 14, 1874."

A fillet of paper with two rows of holes. The extra row for the purpose of discharging or freeing a telegraph line or cable of "surplus electricity."

"July 14, 1874."

A secondary discharging battery at the receiving end of a line for the purpose of freeing a line or cable of surplus electricity.

"July 14, 1874."

Automatic chemical telegraph, one current effecting the recording, the other acting as a discharging or freeing current, and being thrown upon the line immediately after each break in the circuit of the recording current (operated by perforated paper).

"Patent," Oct. 18, 1870.

In a chemical telegraph to prevent tailings or blurs, sets forth the use of the perforated paper fillet itself to effect this object, immediately the paper intervenes to break the circuit.

"Patent," Nov. 19, 1872.

Shows in a chemical telegraph the combination with a transmitting and receiving drum, two or more styluses.

"Patent," April 22, 1872,

No. 1,207, Great Britain,

"Patent," July 23, 1872,

"Patent," Sept. 1, 1873.

In a chemical telegraph two or more styluses insulated from each other, connected to opposite battery poles, operated by the intervening paper.

"July 14, 1874."

In a chemical telegraph to prevent tailings or blurs showing upon the line, immediately upon each and every break in the circuit, a current of opposite polarity (by the perforated paper fillet).

"July 14, 1874."

Shows in a chemical telegraph the combination with a transmitting and receiving drum, two or more styluses.

"July 14, 1874."

In a chemical telegraph of two or more styluses insulated from each other, connected to opposite battery poles, operated by the intervening paper.

A New Way to Spell "Cow."

ALBANY, OREGON, July 31.

TO THE EDITOR OF THE TELEGRAPHER.

TALKING about bovines large and small, here's one that caused a great deal of laughing at the time it occurred, as it does yet when brought up by any of the "old" boys on the line.

A short time after this road went into operation, and before any regular stock cars had been built, flat cars had been fitted up with racks on them for carrying cattle. One day there were several of these cattle and also several coal cars at "F," when orders were received from headquarters to "have the section men take the racks off those cow cars and send them in on No. 6." Cow cars got our operator. After studying over it awhile he came to the conclusion that that term had been used to designate the cattle cars, and as he never "broke," he was not going to ask for repetition of the order; so out he goes and quietly remarks to the section men, "Boys, get your axes and belt h—l out of those cow cars—their's the orders—every rack off." Belting those racks was the order of business for the next half hour or so. The dispatcher, thinking it took them a great while, asked our friend "if the racks were off of those coal cars yet." Our friend smelled a small sized "bovine," and if ever mortal went lively, he did out of that door. (He afterwards told me confidentially that his coat tails would have furnished a good place to play a game of "seven up" on.) On reaching the cars the "Micks" were going for the last cow car!—his feelings for a moment overcome him, but only temporarily, for the next minute he broke out with "Boys, stop! We have played the deuce—order meant, those coal cars, and I got the a and l for a w, and got it cow. These d—d racks cost \$50 a piece, and here's \$350 gone up. H—l with pop! Leave me to my misery."

But, contrary to his expectations, the only thing that ever came out of this was a hearty laugh, and asking "F." if *c-o-u-l* spelt cow.

WEBFOOT.

Automatic, Duplex and Quadruplex.

NEW YORK, Aug. 4.

TO THE EDITOR OF THE TELEGRAPHER.

JUDGING from your columns, and from those of some of the daily newspapers of this city, there has been a considerable stirring up of the telegraphic dry bones on the subject of fast telegraphy lately. Now, I have no special interest in either of the systems discussed, but I like to see fair play all round, and I don't like to see an evident attempt on the part of anybody to appropriate other people's ideas and inventions, and obtain fame and profit therefrom. The latest attempt in this line has been so thoroughly shown up through the columns of THE TELEGRAPHER that the much ventilated party has found his, as he supposed, well laid schemes all coming to naught. This is as it should be, and, for one, I am rejoiced to see it.

No one is disposed to question the value of the duplex system, worked by the Western Union Company, or, so far as I know, deprive Mr. Stearns of his proper credit in connection therewith. If anybody or anything could do this it would be the parties prominently connected with the Western Union Company, who makes him appear absurd or ridiculous by claiming for him much more than he ever claimed for himself. It is unfair to take advantage of Mr. Stearns' absence from the country to thus injure his reputation, and cause the ignorant or unthinking to look upon him as a participator in these well styled absurd and ridiculous claims in his name. He deserves better treatment at their hands, especially after having suffered detraction and depreciation before his patents were purchased by the Western Union Company. Prob-

ably the exact period when the duplex ceased to be worthless, and used by certain "speculative telegraphers" to advance their opposition schemes, was when the assignment of the patents to the Western Union Company was executed and recorded in the Patent Office.

Of the quadruplex, so called, it is scarcely necessary to speak—that gas bag having been so effectually pricked already. The fifty, more or less, wires, and the numerous keys have probably retired from public or even professional observation, and the author or inventor (?) is, no doubt, engaged by this time in hatching up some new scheme to impose upon the public by reproducing an old acquaintance in a new disguise, and under some new and startling cognomen.

Can you tell me who the inventor of practical automatic telegraphy in this country really is? Mr. Craig used to assure us frequently and emphatically that it was Mr. George Little; now he has evidently gone back on Little, or Little on him, and he says that it is Gen. Marshall Lefferts, but that he's engineering a new automatic system which will see both of the L's, and go them 100 to 1000 per cent. better every time. I am glad to notice that brother Craig still adheres to his ten year old child. I don't know what *might* happen if he should just let up on that child, even temporarily! However he may change his allegiance from Little to Lefferts, and from Lefferts to the unknown inventor of his new system, he is, and always will be faithful to that ten year old infant! This is, at least, consistent and commendable in him.

But not only have we Little, Lefferts and the unknown as inventors of the automatic telegraph, on Mr. Craig's authority, but here comes in Tom Edison again in his renowned character of the "Great Inventor," and he, too, is the inventor of the automatic telegraph system! His patents are numerous, it is true, but their value is not so apparent, and whenever he does patent a good thing (like the pucher, for instance,) some other fellow comes along and says it's his, and, what is worse, is prepared to prove it. Alas! alas! this is a sad, wicked world! Who can we credit as inventors if Thomas proves unreliable and deceptive? Then here comes Grace—I may say two Graces—and they claim a part and lot in the automatic telegraph invention, even, amongst other things, to the identical puncher on which, by hook or by crook, the much inventive Edison obtained a patent. And now, at the end (for the present) of this eventful and inventive history, Messrs. Foote & Randall put in their claim as automatic telegraph inventors, and have paid Uncle Sam's Patent Office ever so many dollars to certify to its truth.

Is it not enough to make any person of merely moderate mental calibre appeal to an editor, one of that tribe which is popularly supposed to know everything, to help him out of his dilemma, and tell him what is what, and who is who? If you should fail me in this extremity, I must give up the conundrum, and you will hear no more from

PETER SIMPLE.

[ANSWER.—Good bye, Peter! We can't help you. We have too much regard for our peace and the prolongation of our existence to take sides in any such controversy.—ED. OF THE TELEGRAPHER.]

Answers to Correspondents.

AN INTERESTED BROTHER.—You don't send us your name and address with your communication, and, besides, your ideas are rather disconnected, and your handwriting is not exactly what a first class telegraph operator's should be. What you say has been substantially repeated in THE TELEGRAPHER many times before, and if it has failed of effect from those who are not ashamed to avow their sentiments personally, it can hardly produce a very startling effect if it appears again over your *nom de plume*.

AN OPERATOR.—We know of no operator who can do what you mention.

C.—Mr. F. Vandenberg, Sacramento, California, is General Superintendent of the Atlantic & Pacific Telegraph Co., and Mr. Jas. Gamble, San Francisco, Cal., General Superintendent of the Western Union Telegraph Co. We are advised that the supply of operators on the Pacific Coast is now in excess of the demand.

Shocking.

AT Ames, Indiana, a citizen, who ought to have known better, recently got himself into trouble with the Western Union Telegraph Company. For some time past the company has had trouble with their main California lines—a singular and unaccountable obstruction occurring and recurring at irregular intervals, which baffled for weeks the efforts of the repairers to trace its origin. The great mystery was cleared up, however, week before last, when it was discovered that the line, as it ran by the house of a prominent merchant passing in its way, very near to the top of a porch, was being tapped by the merchant, who used the company's electricity for the purpose of giving shocks to his visitors. Such shocking conduct as this called down the wrath of the company upon him, and they are suing him in the Indiana courts for the recovery of \$100 damages for trouble and expense caused by his action.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

To Subscribers and Friends of The Telegrapher.

WITH the present issue of THE TELEGRAPHER quite a number of subscriptions expire. Under the old arrangement this would be the end of the volume, and formerly a large number of subscriptions ended and commenced in August. The number of these is not now as large as before the change, which made the volume to commence and end with the year, but still a good many do so.

We hope that all of these will renew their subscriptions promptly, and not only so, but will exert themselves to increase the number of subscribers. This can easily be done if all will interest themselves in the good work. The summer months are always very dull as regards subscriptions, but the summer is now nearly over and we anticipate that the usual fall revival will commence very soon. We know that THE TELEGRAPHER is more worthy of support from the telegraphic fraternity now than ever before, and that as a fearless, independent telegraphic journal it has their confidence, as no other similar publication in this country ever has had. We propose to maintain this characteristic of the paper as fully in the future as in the past, and to increase its value, and reliability, and efficiency steadily, as we believe has been done heretofore. The subscription price of Two Dollars per year is so insignificant, in comparison to the value of the paper, that we should suppose that no intelligent telegrapher would be content to be without it.

In conclusion we will merely say to our present subscribers and to those who may hereafter favor us with their subscriptions, or who may exert themselves to obtain subscriptions and the cooperation of others in the support of THE TELEGRAPHER as the representative of the telegraphic fraternity and of telegraphic interests generally, that it will not be suffered to deteriorate in any respect, and that it will be improved wherever improvement is practicable and feasible.

Telegraphic Inventions and Inventors and Western Union Officials.

CONSISTENCY has been declared to be a jewel, probably on account of its rarity. It may be said there is and can be no such thing as unswerving consistency in this age of active development and progress.

We have, during the past few years, had some interesting and amusing demonstrations of the truth of the above statement in the course pursued by certain electricians and telegraph managers with regard to improvements in telegraphic apparatus and systems of operation. These, as they are proposed and actually put in operation, are declared to be old, impracticable, or valueless, but ultimately, as interest changes, are found to be of exceeding value, and are as extravagantly lauded and praised as they have been before unreasonably decried, denounced and ridiculed. The duplex telegraph of Mr. STEARNS, and its treatment before and after the patents were purchased by the Western Union Telegraph Company, by leading officials of that company is a very striking instance of this.

The stultification of those officials must have been most mortifying, and it would reasonably be supposed that, as a burnt child is said afterwards to avoid the fire, they would be exceedingly careful how they committed themselves again in a similar manner. Experience, however, does not seem to have been very effective, as they are now going through the same process in regard to the automatic telegraph system which has similarly been ridiculed and denounced. They are at last convinced that there is something in automatic telegraphy, and are experimenting with the slow and inferior system of Sir CHARLES WHEATSTONE, with what result we are not yet informed. No doubt in due time a column of the *Tribune* or *Times* of this city will be filled with a hifalutin description of the wonders accomplished or to be accomplished by some great automatic invention, which, upon examination, will be found to be the WHEATSTONE apparatus under a new name, the production of the latest inventive humbug employed by that Company.

We allude to these instances as the most recent and widely known, and which have attracted general attention among telegraphers and others. They must inevitably destroy all confidence in the official scientific and practical declarations of the officials who blow cold and hot alternately as the supposed exigencies of the moment may require upon telegraphic improvements of inherent and demonstrable value. It is not apparently considered what the actual merits of any invention or improvement are in treating of them, but how they are likely to affect the interests of this or that Company. When the pecuniary interests change there appears to be not the slightest personal or professional objection to laud as extravagantly as was previously denounced. But we must give credit for one thing—that is, that no attempt is made to explain or excuse the inconsistency, and it is seemingly taken for granted that what has been said to the contrary heretofore will be forgotten, and the latest declaration be swallowed without cavil or reference to former antagonistic outgivings from the same source.

Undoubtedly there may be and often is good reasons for changing even an honest opinion, but in such case the main way is to acknowledge the previous error, and, as far as possible, apologise and atone for it. Then the subsequent convictions are entitled to consideration and respect.

We are watching with considerable interest the gradual development of faith in the automatic telegraphy in Western Union official quarters. It is not a very long time since we were officially assured that automatic telegraphic transmission was impossible at a greater rate of speed than by the ordinary methods, except for very short distances. This has been contradicted, however, officially, and the fact of rapid automatic transmission over long circuits conceded. Various other concessions have also been made of advantages claimed by the inventors and advocates of

automatic telegraphy, and we have no doubt but that the system would be gladly adopted and as extravagantly extolled in the next official report, if it could be secured exclusively for that company.

If we might be permitted to make a suggestion to the managers of the Western Union Company, it would be that investigation into the merits of an invention or improvement should precede, not follow, its rejection or approval. Such investigation should be conducted with a view to ascertain its merits and defects, and not merely to discover either as the present apparent interest of the company or its officials might seem to require.

The ventilation of the great quadruplex invention (?) which was of such enormous value, and which at one stroke quadrupled the capacity of the entire number of miles of line worked by the Western Union Company is an instance of approval and faith before actual practical tests, as remarkable as the previous condemnation of the duplex and automatic systems and apparatus. The pretended inventor of this remarkable quadruplex evidently had made his market before producing his goods. This individual seems to be fortunate in one thing at least, and that is in impressing one person after another with the idea of his great inventive genius, and that fame and fortune is sure to attend a connection with him. It is true that in no instance has this been realized; but then we know that many blawks must be drawn in every lottery, yet this does not destroy the confidence of purchasers of chances in ultimately drawing valuable prizes. It is also true that this person's inventions (?), except those derived from others, always stop short of success, and not unfrequently, as in the case of the quadruplex, may be found substantially described in electrical and telegraphic works, not difficult of access, but still he succeeds in imposing himself and his so-called inventions upon one telegraph official and manager after another. It will be seen from a communication in our correspondence column that another person claims whatever of merit there may be in this latest production of his genius not derived from European sources. It seems to be his fate to always have fame and honor snatched from him by some person who lays claim to his "original" ideas. And yet this person is taken up and made much of by the President and electrician of the Western Union Company! It may be said on their behalf, however, that in this they are only successors to the managers of the Gold and Stock Telegraph Company, the Automatic Telegraph Company, and even of our friend, D. H. CRAIG, who at one time thought him a most remarkable and unappreciated genius, but who was soon disabused of that idea from practical experience and intercourse with him. We may at some future time prepare his telegraphic biography from his entrance and departure from a certain telegraph office in Maine to his present proud position as the friend and collaborer of the electrician of the Western Union Telegraph Company. It will be interesting reading, and will show the gullibility of human nature, even when embodied in telegraphers and electricians.

The Extension of the Telegraph in Central and South America.

THE telegraph is making notable progress in the Central and South American States and countries. The obstacles to be overcome in these countries have been very great, but this is generally being done, and the telegraph is being extended to all the principal cities and towns, and the several States and territories are brought into close and intimate telegraphic communication with each other. This is a substantial and unmistakable sign that they are emerging from the revolutionary and unstable condition in which they have so long been and entering upon an era of civilization and prosperity which shall ultimately develop their immense resources and ameliorate the condition of the great body of their people. The governments are becoming more stable and effective, and their inhabi-

tants are learning that true liberty can only be established and maintained by a regard to law and order, to which most of them have hitherto been strangers. In no part of the world has the telegraph more important functions to perform as a civilizing and ameliorating agent than in these countries, whose progress has been retarded and whose development has been prevented by the ignorance and bigotry of the people, and by the frequent revolutions and changes of governments consequent upon these. With great possibilities and opportunities they have been a byword and reproach, the inhabitants shiftless and impoverished, and the public men ambitious and venal to a degree which can hardly be appreciated by the people of this country, where education is almost universal and liberty and license are not regarded as synonymous terms. Much time will yet be required to thoroughly change and reform the condition of affairs, but the good work has begun, and telegraphs and railroads which are now being extensively introduced are powerful agents in carrying it forward to a glorious accomplishment.

Was He a Pioneer Line Constructor ?

UNDER the title of "A Misstatement Corrected" we printed in THE TELEGRAPHER for August 1, from the *Ithaca Journal*, a letter from Mr. EZRA CORNELL, in reference to the connection of a Mr. G. E. SMITH, recently deceased in Maine, with the construction of the experimental telegraph line between Washington, D. C., and Baltimore, Md., in 1844. It will be remembered that Mr. CORNELL stated that "there was no person by the name of SMITH connected with Prof. MORSE, in any way, with the setting up of the first line of telegraph poles between Washington and Baltimore."

We are informed since that statement appeared that the Mr. G. E. SMITH, whose decease called out the original statement and contradiction, certainly claimed to have been engaged in that enterprise, as a subordinate, in the construction of the line. Perhaps Mr. CORNELL has forgotten him after the lapse of so many years; but, at all events, he has always received credit with those who knew him for having been one of the pioneer telegraph line constructors.

A Number of The Telegrapher Wanted to Complete a Volume.

A SUBSCRIBER to THE TELEGRAPHER desires to obtain a copy of the paper for April 5, 1873, vol. ix., No. 352, to complete his file of that volume, in order to have it bound. Any one having a copy of that number which can be spared will confer a great favor by forwarding it to this office.

Personals.

Mr. ABRAM J. LOCKE has resigned his position on the night force in the Western Union office, at No. 145 Broadway, New York, and has returned to Peace, Kansas. It is said that Mr. LOCKE could come earlier to the office and stay later and keep it up longer than any man who ever put his foot inside the door at No. 145. The gentleman left his farm, his wife and children and everything else behind him and came to New York to earn money to carry out his plans at home. It will be gratifying to all who are interested in the weal of those who "have a purpose" to know that at the end of a year Mr. LOCKE has departed to join his loved ones with some twelve hundred dollars, after paying all his expenses. In sound health and rich in the esteem of every man and boy in the office the self-denials of the year must be essentially softened by the consciousness of a good work well done and an army of new friends enlisted. Mr. LOCKE was one of the old force at Troy, New York, having emigrated to Kansas only a few years ago.

Mr. W. H. CLARK, of No. 145 Broadway, New York, is rusticated at St. Clair, Pa.

Mr. C. FRED HUTCHINSON, recently of the Western Union, Baltimore, office, has accepted a position on the night force, at No. 145 Broadway, New York.

Mr. EDWARD GORDON has accepted a position at No. 145 Broadway, New York.

Mr. W. M. ALLISON has accepted a position at No. 145 Broadway, New York.

Dr. FOWLER BRADNAC has accepted a position with the Western Union Company, at No. 134 Pearl street, New York.

Mr. W. E. TACKLEY has resigned his position with the Western Union Company at Augusta, Ga., and is at home in Lancaster, Pa.

Mr. F. B. RAE, recently chief operator with the A. and P. at Syracuse, New York, has accepted a position with the Western Union Company at No. 145 Broadway, New York.

Mr. J. B. BOGART, late of the N. J. C. R. R., at Wilkesbarre, Pa., has accepted a position at No. 145 Broadway, New York.

Mr. HENRY ROTHMICH, of Providence, R. I., has engaged with the Franklin Company at No. 198 Broadway, New York.

Mr. A. B. ELLISON, chief operator C. & N. W. Railway telegraph, Baraboo, Wisconsin, returned August 1st from a two weeks' trip to Canada.

Mr. F. G. BARDALL has been transferred from Winona Junction, Wisconsin, to train dispatchers' office, C. & N. W. Railway, Baraboo, Wisconsin, night service, *vice* Mr. L. M. SCHNELL.

Mr. ELLIS PURPLE has been transferred from West Salem, Wis., to Winona Junction, C. & N. W. Railway.

Mr. P. J. BYRNE has been transferred from Elroy, Wis., day office, C. & N. W. Railway, to "Hg" Tunnel No. 3, *vice* Mr. A. F. BRIGGS, extra operator.

Mr. F. E. PEARSON has been transferred from Beloit, Wisconsin, night office, C. & N. W. Railway, to Elroy, Wis., day office, same road.

Mr. W. LAWSON has been transferred from Evansville, Wis., to Beloit, Wis., night office C. & N. W. Railway.

Mr. GEORGE C. CHASE has been appointed day operator of the C. & N. W. Railway at W. Salem, Wis.

Mr. C. B. GOSS has been appointed night operator, C. & N. W. Railway, at Evansville, Wis.

Mr. H. J. BOSWORTH, day operator in the Train Dispatchers' office at Baraboo, Wis., C. & N. W. Railway, has resigned, and is rusticated for the present.

The Telegraph.

Telegraphic Communication with Uruguay. — Official Congratulatory Message.

THE following congratulatory telegraphic message was received at the White House on Saturday evening, August 8, and forwarded to the President at Long Branch:

To the President of the United States of North America, Washington.

I am most happy to greet His Excellency, the President of the United States of North America, on the memorable occasion for the nations which the electric wire this day places in immediate communication with each other, thus drawing closer the bonds of sincere and cordial friendship which happily unite them.

(Signed), THE PRESIDENT OF URUGUAY.

Foreign Telegraphic Notes.

THE Eastern Telegraph Company have announced that their Vigo-Lisbon cable was broken on Tuesday morning by the Pacific Company's screw steamer Chimborazo, near Lisbon, in thirteen fathoms of water. It is anticipated that the line will be speedily re-established, and during the interruption messages for Egypt and the East will be forwarded *via* Marseilles.

The total number of messages forwarded from postal telegraph-stations in the United Kingdom during the week ended July 18, 1874, was 410,551—an increase on the corresponding week last year of 48,769.

The managing director of the Brazilian Submarine Telegraph Company states that a number of messages sent to St. Vincent on the 16th of July were in time to catch the Cape steamer, which left Plymouth ten days previously, and he desires "to draw the attention of the commercial world to the advantages thus offered, in order that the respective steamship companies may be induced to arrange permanently to call at that station."

The receipts of the Submarine Telegraph Company for the month of June, 1874, amounted to £8,647 5s. 8d., against £7,718 5s. 7d. for the corresponding month of last year.

The line connecting the Central American Republics of Guatemala and Salvador was opened to the public at 4½ P. M., of the 2d of June, amidst much

rejoicing and enthusiasm. The tariff for ten words is 50 cents between any office in one republic and any in the other, each additional five words or fraction thereof, 25 cents.

The Telegraph Construction and Maintenance Company.

AT the half yearly meeting of the Telegraph Construction and Maintenance Company, recently held in London, the chairman, Sir Daniel Gooch, M. P., said:

"I have very little to say to you to-day. We have completed the Brazilian cable (as you, no doubt, have seen by the newspapers), and on Thursday that longest section will have completed its thirty days' trial, when I hope it will be taken off our hands. The section between Lisbon and Madeira, which was broken last autumn, has remained broken all winter; the depth where the fracture was was 2,500 fathoms, but the staff of officials (and very much to their credit) have been able to recover both ends, and to put a piece in the deepest water in which we have had the operation to do before. (Cheers.) We have, during the past half year, laid the Black Sea cable, which was opened within the last few days. I am glad to say the Brazilian cable shows satisfactory results, so far, in the interests of the shareholders of that company, and I trust it will improve; in fact it has already made more than the calculation which was formed of its earnings. I may mention that the Great Eastern sails in a few days with the other Atlantic cable, and I hope that in the course of a month or two that will have been successfully completed."

In reply to various questions, the Chairman said the charter of the Great Eastern would expire in the autumn of next year; the company only possessed the Hibernia and the Edinburgh, which have been laying the Brazilian cable.

A shareholder asked if there was any intention to pick up the old Atlantic cable.

The Chairman: "I believe there will be no attempt made this year. Captain Halpin has been absent in the Brazils, and is now going to lay the Atlantic cable, and it was considered that by the time that was completed it would be too late to attempt to pick it up this year; but I believe the intention of the Anglo-American Company is to take steps early next year to try and recover that cable and restore it." (Cheers).

Mr. Ford referred in very complimentary terms to the ability, intelligence and zeal manifested by the employees of the company, and the valuable services and assistance received from them. He proposed a vote of thanks to them, which was seconded by Mr. W. Abbott, and passed.

Globe Telegraph and Trust.

THE report states that in exchange for stocks and shares of other companies 119,004 preference and 120,722 ordinary shares of this company have been allotted. Cash subscriptions have also been received for 5,291 preference and 3,841 ordinary shares, making the total subscribed capital at this date £2,488,580. The total revenue of the company accruing from dividends on securities and from interest on loans, &c., amounts to £141,481 for the year, out of which £101,271 has been already distributed in interim dividends. The working expenses for the year amount to £1,267, leaving a balance of £38,943, out of which the directors now propose a distribution of 1½ per cent., or 3s. per share, upon both preference and ordinary shares, making, with the previous interim payments, a total dividend for the year of 6 per cent. on the preference, and of 5½ per cent. on the ordinary shares, carrying forward £1,614. In addition to the dividends credited in the accounts, the company's revenue for the past year includes one third of the quarterly dividend payable on 1st August next on its Anglo-American Telegraph stock. This sum, amounting to £3,539, will be credited in the next year's accounts. In accordance with Article 22 of the Articles of Association, Sir James Anderson, Julius Beer, Esq., and Sir George Elliott, Bart., M. P., will retire, but being eligible they offer themselves for re-election. In conformity with the Articles of Association the annual remuneration of the directors and auditors is to be fixed by the meeting.

Future Work of the Challenger.

IT is one of the appointed duties of the staff of H. M. S. Challenger to make, during her voyage between Port Jackson and Auckland, a connected series of deep sea soundings, with a view to ascertaining the condition and formation of the bottom of the ocean lying between the shore of Eastern Australia and New Zealand. This will be done under the special direction of the hydrographical department of the Admiralty—the object of such a careful line of examination being to ascertain as far as possible what are likely to be the material difficulties to be surmounted in the laying down of the proposed New Zealand cable—one of

the last long desired connecting links between the mother country and the out ports of her wide spread colonial empire.

Miscellaneous.

EXPERIMENTS ON ELECTRICAL TRANSMISSION THROUGH WOOD.—M. du Moncel has recently been experimenting on electrical transmission through wood.

TOMMASI'S HYDRO-ELECTRIC CABLE.—M. Tommasi has been experimenting lately with his hydro-electric cable, with a view to its practical improvement.

NEW THERMO-ELECTRIC PILE.—M. Clamond, the author has been improving his apparatus. He found in it a considerable increase of resistance, and this was due to two causes—(1) Oxidation of the contacts of the polar plates with the crystalized bar under the influence of heat; and (2) splitting of the bar and separation of its different parts in planes perpendicular to its length.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF THE RECEIPT OF ONE ASSESSMENT SHOULD BE TAKEN AS A RECEIPT FOR ALL THE PREVIOUS ASSESSMENTS.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS No. 65, UP TO AND INCLUDING AUGUST 10TH, 1874.

- 6, 15, 31, 33, 52, 55, 58, 70, 76, 80, 84, 90, 95, 97, 98, 99, 100, 103, 120, 121, 122, 141, 142, 143, 144, 153, 154, 156, 158, 160, 164, 171, 175, 179, 183, 189, 190, 191, 193, 197, 198, 206, 218, 227, 230, 245, 248, 252, 274, 276, 280, 316, 341, 353, 357, 360, 362, 364, 366, 382, 418, 426, 430, 431, 466, 468, 469, 470, 471, 475, 476, 478, 482, 484, 510, 511, 512, 514, 558, 557, 560, 561, 566, 569, 573, 574, 586, 590, 605, 617, 618, 642, 646, 649, 655, 659, 662, 663, 664, 665, 667, 669, 671, 694, 710, 712, 717, 723, 724, 728, 730, 733, 750, 751, 756, 780, 781, 782, 783, 785, 786, 799, 802, 808, 812, 813, 823, 831, 836, 838, 842, 856, 870, 871, 874, 875, 876, 897, 901, 904, 905, 906, 926, 938, 942, 944, 949, 954, 957, 959, 963, 964, 972, 977, 979, 991, 992, 1014, 1016, 1030, 1031, 1033, 1034, 1040, 1041, 1046, 1050, 1057, 1063, 1069, 1072, 1074, 1076, 1088, 1090, 1098, 1100, 1101, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1122, 1123, 1127, 1131, 1139, 1141, 1164, 1190, 1198, 1204, 1205, 1211, 1217, 1221, 1225, 1234, 1237, 1238, 1248, 1256, 1268, 1270, 1274, 1277, 1281, 1282, 1283, 1284, 1285, 1286, 1288, 1292, 1294, 1298, 1304, 1336, 1553, 1354, 1355, 1356, 1371, 1375, 1376, 1398, 1405, 1406, 1417, 1418, 1421, 1428, 1430, 1432, 1433, 1449, 1465, 1469, 1471, 1474, 1475, 1476, 1483, 1485, 1497, 1498, 1506, 1508, 1528, 1529, 1530, 1537, 1546, 1558, 1563, 1576, 1579, 1582, 1596, 1597, 1616, 1626, 1649, 1652, 1660, 1661, 1662, 1663, 1665, 1667, 1672, 1673, 1684, 1687, 1688, 1696, 1699, 1700, 1701, 1702, 1704, 1707, 1709, 1710, 1713, 1714, 1718, 1721, 1724, 1726, 1727, 1728, 1733, 1746, 1747, 1750, 1751

- 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1765, 1766, 1767, 1768, 1769, 1771, 1788, 1789, 1791, 1802, 1810, 1813, 1815, 1818, 1828, 1830, 1839, 1840, 1841, 1844, 1845, 1847, 1857, 1858, 1859, 1860, 1863, 1864, 1889, 1893, 1896, 1897, 1931, 1938, 1953, 1954, 1962, 1972, 1973, 1986, 1992, 1993, 1996, 1997, 2005, 2007, 2010, 2012, 2022, 2023, 2024, 2026, 2033, 2041, 2053, 2074, 2075, 2084, 2085, 2089, 2092, 2094, 2098, 2099, 2102, 2108, 2109, 2112, 2120, 2131, 2136, 2156, 2157, 2159, 2165, 2166, 2167, 2168, 2171, 2180, 2183, 2184, 2185, 2198, 2208, 2210, 2211, 2215, 2217, 2220, 2225, 2226, 2227, 2230, 1231, 2234, 2235, 2245, 2246, 2254, 2256.

No. 62.—790, 1275, 1542. No. 63.—1601.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Table with columns: AUG., WESTERN UNION, ATL. AND PAC., AMER. DIST. and rows for dates 6, 7, 8, 10, 11, 12.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each.

For the week ending July 7, 1874, and bearing that date.

REISSUE.

5,958.—ELECTRIC SIGNALING APPARATUS FOR RAILROADS.—Wm. Robinson, Brooklyn, N. Y.—Patent No. 130,661, dated Aug. 20, 1872. (Filed Apr. 24, 1874.)

Constantly closed circuit to signal magnets, preferably through rails of an insulated section of track. Car axles form a shunt circuit of low resistance, causing magnets to act by demagnetization.

- 1. The combination of a constant circuit, a magnet or magnets operated or controlled without actually opening the circuit of said magnets, and an electric railway signal or signals, substantially as described.
2. A visual or semaphoric signal, in combination with a constant circuit, composed in part of a rail or rails of a railroad track, substantially as set forth.
3. An alarm or audible signal, in combination with a constant circuit, composed in part of a rail or rails of the track, essentially as described.
4. An additional or secondary circuit, in combination with a primary circuit, composed in part of a rail or rails of the track, essentially as and for the purpose described.
5. A visual and an audible signal, in combination with each other and with a constant circuit, composed in part of rail or rails of the track, substantially as described.
6. The battery B and magnet M, so connected to the rails of a railroad track that when connection is established between the rails of said section by the wheels and axle of a car, or by other superior conductor, the electric circuit is partially changed and the signal operated through the demagnetization of the magnet M, substantially as specified.
7. A signal constructed partially of tubular material, for the purpose of securing lightness combined with strength, in the manner substantially as herein set forth.
8. The arrangement of the pivotal bearing of the lever e at a point midway between the horizontal lines of exposure and concealment of the signal banner, as shown and described, for the purpose set forth.
9. The combination of the elastic spring t, or its equivalent, with the levers L and e and signal banner S, substantially as set forth.
10. The battery B, in combination with the wires k k', rails a b of a railroad track, wires l l', and magnet M, substantially as and for the purpose herein described.
11. The additional or secondary circuit r, in combination with the magnet M, wires l' l' k k', battery B, and section of rails of a railroad track, essentially as described.
12. A railway signal or series of signals, in combination with a constant circuit, as described, charged in its normal condition, essentially as indicated.

For the week ended July 21, 1874, and bearing that date.

153,309.—ELECTRIC TELEGRAPH APPARATUS.—R. K. Boyle, Brooklyn, N. Y. (Filed June 27, 1874.)

Induced currents sent over line, operating an induction coil at receiving station, the current from the latter operating in turn another induction apparatus, in which the ordinary relation of fine and coarse wires is reversed—that is, the induction coil is the coarser. By this reduplication of induction coils a practically continuous current is obtained.

- 1. In an electric telegraphing instrument, the combination of one or two induction coils, C C', and their circuit breaking armature lever d with line wires 15 and 16, and with an induction coil E, the inner helix of which connects with a pen or other device for producing marks or signs, substantially as shown and described.
2. The combination of an original induction coil, D, with the induction coil E, line wires 15 and 16, and with the induction coils C C' and their circuit breaking armature levers d, substantially as and for the purpose set forth.

TRADE MARK.

1,889.—ELECTRIC AND GALVANIC APPARATUS.—Jerome Kidder, New York, N. Y. (Application filed July 14, 1874.)

"The representation of a sphere or globe surrounded by clouds, from which proceed and extend over or partially across the sphere representations of flashes of lightning or electricity."

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

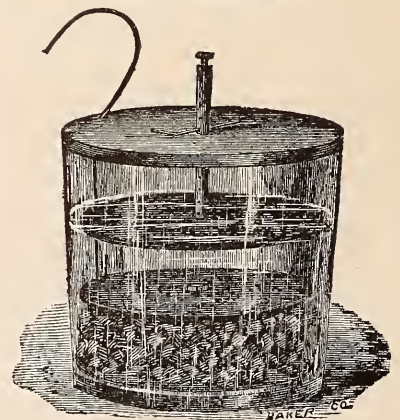
COMPARISON OF RATES.

Table comparing rates for New York to various cities (Trenton, Philadelphia, Baltimore, Washington) by Automatic and Western Union methods.

NEW YORK OFFICES:

Table listing New York offices at 66 Broadway, 21 New St., 108 Front St., 143 West St., 1218 Broadway, 481 Broome St., and 307 Pearl St.

BLISS RESERVOIR BATTERY. PATENT APPLIED FOR.



Price per Cell, - - - - \$2.00.

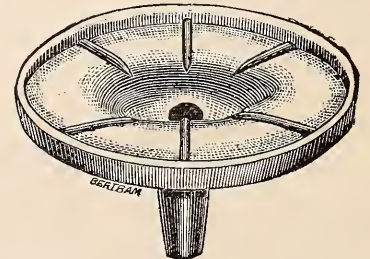
This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

GEO. H. BLISS & CO.,

41 THIRD AVENUE,

Chicago, Ill.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use. Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost. Price, 40 cents each. Liberal reduction for large quantities. A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

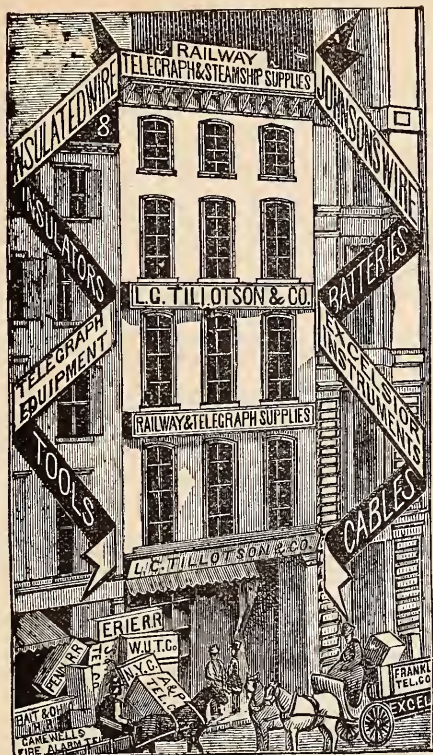
IMMENSE REDUCTION OF PRICES.

New York, May 30, 1874.

We are offering our Telegraph Instruments at 20 per cent. discount from our list, or from the present published price list of any other manufacturers of first class Telegraph Instruments. Quality will be strictly maintained.

L. G. TILLOTSON,

8 DEY STREET, N. Y.



BUY THE BEST.

IF YOU WANT
EQUIPMENT

FOR A
TELEGRAPH LINE,
ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
and **QUALITY** THE **BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

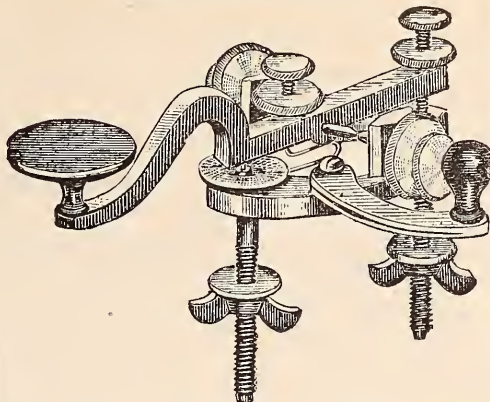
We are offering 20 per cent discount from list prices on all
instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

WATTS & CO.,

BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

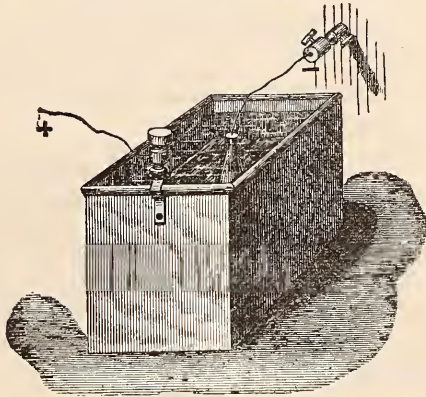
Does not keep line closed by hindering against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit
r out out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine
our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,

BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.
Our new Illustrated Catalogue contains some useful information
for Superintendents and others interested in the Science of
Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and **Labor at last Secured.**

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for
manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic
and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the
battery. Sulphate of copper is the only chemical required to be
used.

These Batteries have been fully tested during the last year,
although only recently offered for sale, and have proved to be
superior to any other as regards efficiency, economy and dura-
bility. When once set up they require no attention for from
four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for
running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a
saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.
Descriptive circulars and price list forwarded upon applica-
tion to

F. L. POPE & CO.,

(P. O. Box 5503.)

38 VESEY STREET, N. Y.

GEO. H. BLISS & CO.,

41 THIRD AVENUE,

CHICAGO, ILL.

—:o:—

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood
Bases.

RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to
stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty;
superior in all respects.
IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and KEY on same base, making an ele-
gant set.
WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARREST-
ERS, GROUND, BATTERY and REPEATING SWITCHES.
WESTERN UNION (new style) SWITCH BOARDS.
ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

—:o:—

AGENTS FOR

KIDDER'S MEDICAL APPARATUS,
JONES' LOCK SWITCH BOARDS,
HILL'S ANNUNCIATOR and FIRE ALARM,
PUTT'S MECHANICAL INSTRUMENTS,
UNITED STATES ELECTRIC GAS LIGHTING APPARATUS.
POPE'S RAILWAY SIGNALS,
SELDEN'S PRINTER,
ANDER'S MAGNETIC DIAL and PRINTER
GROVE, CARBON, BUNSEN, DANIELLS, LECLANCHE, LOCK-
WOOD, CALLAUD, SMEE and GRENET BATTERIES.

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and AWL CLIP.

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WASHBURN & MOEN'S celebrated GALVANIZED WIRE; also,
AMERICAN COMPOUND WIRE.

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KENOSHA INSULATORS,
SCREW GLASS INSULATORS,
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BRASS ECCENTRICS,
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STUBBS and PATENT PLIERS.

VAUGHAN'S AUGURS and TOOLS in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID;
the finest in the Market.

TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER,
and STATIONERY.

SECOND HAND RELAYS, CUT-OUTS and REGISTERS very
cheap.

—:o:—

Repairing and Model Work promptly attended to.

Bliss' Manual and Price List furnished free on
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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which referencels
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
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AND THE

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of the system. They intend that, as far as possible, it shall be

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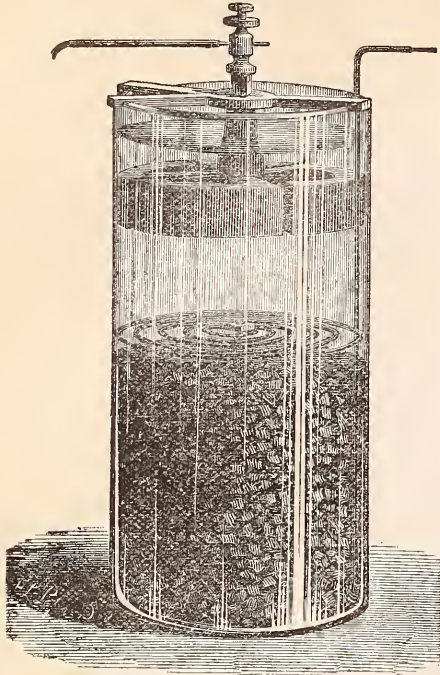
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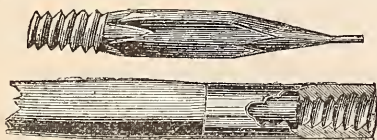
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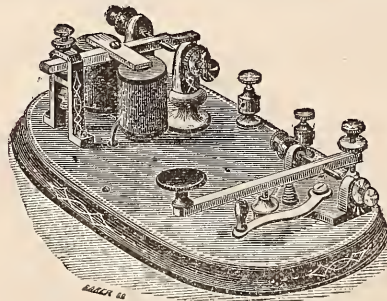
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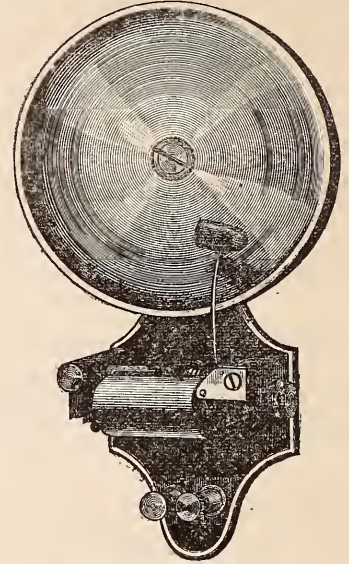
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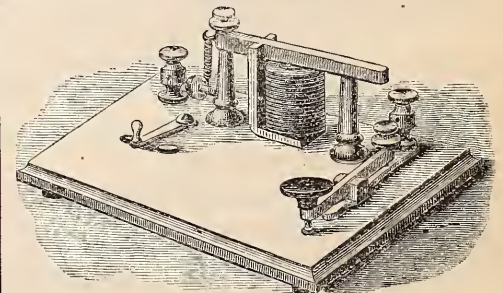
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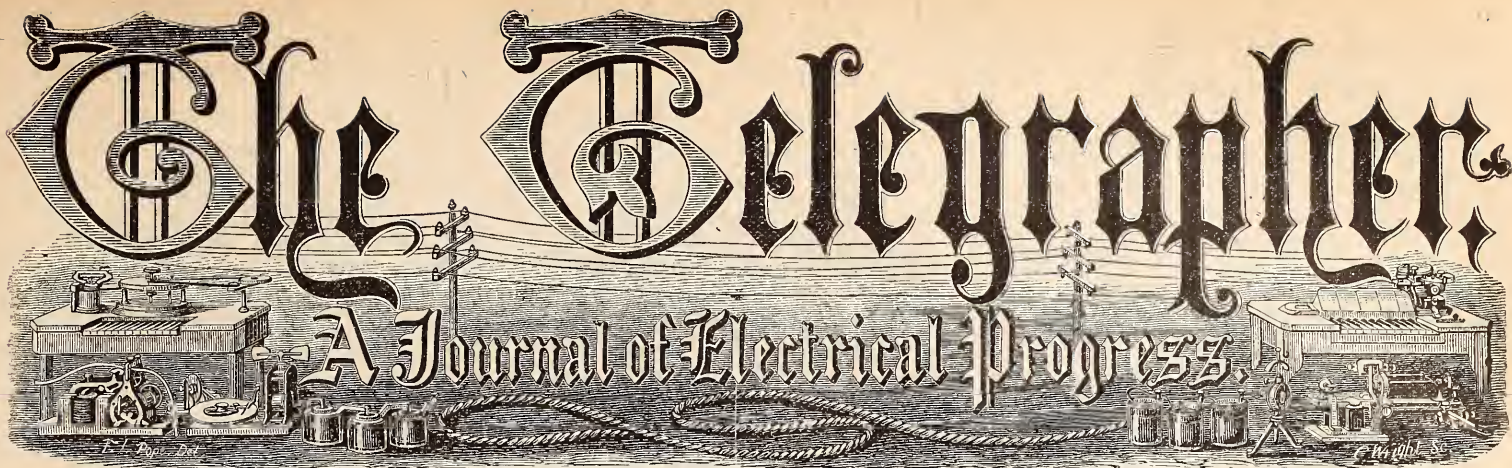
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, August 22, 1874.

Whole No. 423

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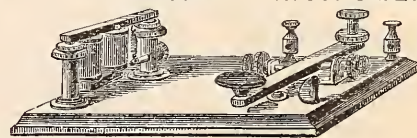
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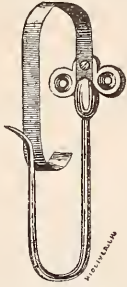
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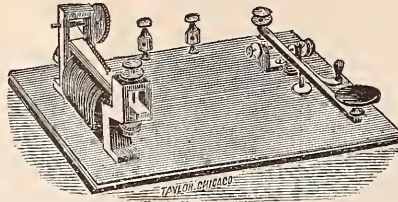
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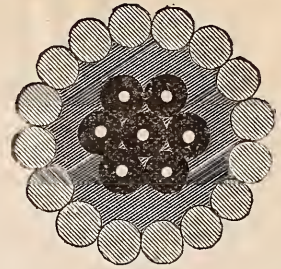
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, AUGUST 22, 1874.

VOL. X. WHOLE No. 423.

Original Articles.

How Two of the Boys got Taken in.

BY WEBFOOT.

At a church festival held in a certain Oregon town it was decided to engage the services of the two Knights of the Key that attended to the telegraph interests in the town aforementioned, and persuade them to construct a telegraph line from one end of the Opera House to the other, and transmit the amorous messages by telegraph from the masculine "filliciums" to their sweethearts at the moderate sum of a "hit," American gold coin, regardless of the number of words contained in the telegram.

At the desired time the line was ready for business and the two artists at their posts, and for a while everything went along swimmingly, and the managers were delighted with the amount of "tin" rolling in from messages sent; but in a short time the "filliciums" on the masculine side of the house sent something to the female "filliciums" that raised their "dander" to such a pitch that they absolutely refused to receive any more messages unless proper apologies were made. Of course this had a demoralizing effect on the business, and dividends failed to be returned. After waiting a while for business to resume, and concluding it was a complete "burst up," our two artists commenced chatting and expressing their opinions in regard to the young ladies present, and what was more impolite, in the opinions expressed they were more sincere and emphatic than elegant in the language used.

No. 1 artist commenced by remarking that "it was getting—monotonous sitting here; that we had better cut out and give it up."

No. 2 replied—"Yes, I'd be on it if it were not for a blame splendid looking girl here by my side, who looks as if she never saw the machine before; and if it were not for the daro old spindleshank, lantern jawed old buffer by her side, I'd strike up a 'gas' and have some fun. I'd like to give her one right on her mouth for luck."

No. 1—"The — you say! that's rich. My crowd here are all boys, and mad as thunder at the way the girls served 'em. Give that young 'greeny' a buss any way, and send old spindleshanks down here and I'll tap his sneller, so as to make the claret flow copiously."

No. 2—"Old buffer might get hot. He could clear both of us out with one hand. He's a son of a gun for size. Can't say I admire her choice in a gallant, taking a mummy like him. You ought to see him whispering to the gal, and he is actually laughing. Just think of him laughing!"

No. 1—"That's rich. He thinks he's got off something good. Tell him he'd better take a spin. Ask him if his mother knows he's out."

No. 2—"You don't suppose such an object ever had a mother. Why, he's the feller that Darwin lost. He belongs to that breed, and is a thoroughbred, too. I'm going to tell Darwin he's here, so he can catch him—by the tail."

No. 1—"Ha! ha! That's pretty good. Say—it's a—good thing the old spindleshanks don't understand what we are gassing about; he might get 'heated' just a little."

No. 2—"That's so; but no danger of that. But I tell you confidential he could just use us both up. I should like for him to know what we are saying, but if he should find I had a hand in it, I'd—take a walk."

No. 1—"I'll fix him. I'll get some one to—" (No. 2 breaking in). "Hold on; here comes old buffer. He's writing a message—now for fun! but he looks devilish hot over something—mad as a hornet! (Taking up message and reading it.) Holy Jehosaphat! thunder and lightning! (To No. 1.) "Here, just take this and get it through your wool. I'm going to skip out soon as old buffer will give me a show to run the 'blockade'—here goes."

"To the two simpletons, so called Oprs., in Opera House to-night:

"Old buffer is pretty good, 'fair to middling,' as we say on our grain reports, but darn you! I'll make you two idiots think it's better than good. Just come out-

side that door and if I don't wallop you so that you can't see for a month of Sundays. That 'young greeny' is my wife, and understands telegraphing—sight better than either of you do or ever will. I am stopping at the — Hotel, and if you don't come and offer a suitable apology before noon to-morrow I'll come down a'd clean out your darn old office—d—d if I don't! I'm on it but you ain't."

"Yours, in—a horn.

"JIM' BLACKBURN,
"Of 'Xs.'"

No. 1 got it correct, but it was amusing to watch his noble countenance while it was being received. After it was finished he remarked over the string that "That's H—alifax! We're in for it. I'm going. I'll see you in the morning—my head aches. G. N.," and he "vamoused the ranche," leaving "No. 2" at the mercy of "Jim;" but the latter, after laughing at him good, shook hands and introduced him to Mrs. B.; made him promise to "do so no more." In the morning "No. 1" was missing, but an envelope was found bearing the following: "My father was taken sick last night and I had to go out this morning. Be gone about a week. Get some one work for me."

The Honesty of Youthful Writers.

BY OWTON A FLYE.

I GET more confidence in human nature every day. I know it will average honest. You take young literary people, for instance, they never startle their readers with a great, overpowering, soul lifting passage of fervid eloquence, but that they debit themselves at once by hemming it in with quotation marks. Now, poliev doesn't prompt this but honesty dictates it, and I think I am right when I say that literary people, at least, will be honest, even at a sacrifice. This is especially true of the fledglings in letters, for you never saw an effusion yet that didn't have from one to a dozen quoted sentences, extending all the way from a hackneyed, over written and much abused maxim of ten words to the long outburst which often reaches half a column in length. The writer must understand that there is no real merit for himself in a batch of quotations from more original minds than his own; and, besides that, this charity which we all profess to have in our hearts should restrain us from making good sayings unpopular by causing them to become stale, even though the author be dead and gone.

I will engage to write the grandest passages the world has ever seen, both for depth of thought and sublimity of expression, with no other help than a Sanders' Fifth Reader.

For example: "When Freedom, from her mountain height," "saw Cassius' dagger fall" "mark how the blood of Cæsar followed it," "and while Olympian Jove" "frowned on the Numidian Lion," "Greece, with melting heart, paid homage to the gods," "And yet o'er all there crept the awful, all pervading gloom of oppressive tyranny, that never was uplifted until" "Freedom shrieked, and fought and won" "in bleeding Kansas," "and the American eagle smiled on all that woe."

Now, I submit whether there is anything in the above to prevent my being received as a genius, except the everlasting quotation marks, which take the laurels from my spotless brow and lays them on the graves of people who have been dead two thousand years, more or less. No! I'm opposed to this mock honesty, because minds are so alike in a great many respects that it would be quite natural for me to think of and express an idea something like what Pythagoras may have broached ages ago, and why should I credit him simply because he said it first? He don't need it and I do.

Let's go it alone. If I say something good, and you never heard it before, why, let your heart go out to me; and if you have heard the same thing by somebody else, be charitable.

The Latest Application of Electricity.—The Automatic (Fire) Signal Telegraph.

SINCE the time when Sir Walter Scott pronounced his eloquent eulogium upon James Watt, that "potent abridger of time and space," so marvellous has been the progress of invention in the improvement of the locomotive and the steamship, and particularly in the application of electricity through various stages of increasing serviceability, that its subject himself, hardly less than the "hard" who pronounced it, would be startled almost into incredulity by the audacious ingenuity which, in the most advanced nations, has completely transformed the aspect of their civilization. It is not our present purpose to yield to that fascinating temptation which would set us about stating in a detailed and sequential form what these developments and inventions are, but to call the attention of our readers to the latest, and, so far as we know, the most

interesting and surprising adaptation of human control over the electric fluid.

We are indebted to Mr. W. B. Watkins for this wonderful invention. This gentleman, originally a dry goods merchant in New York city, having for several years employed himself in the endeavor to discover some means of obviating the great damage done by water at fires, on account, chiefly, of the headway made before the possible arrival of appliances for extinguishing them, in the year 1870 procured his first patent for an invention by which a fire was itself made to give an alarm in its incipient stage, thus inducing the earliest possible use of the facilities already in employment for the purpose of putting out conflagrations. Between that date and April, 1873, he took out other patents for the protection of the several improvements he successively introduced, and during the following summer the Automatic (Fire) Signal Telegraph Company was formed, with the following officers and directors, who, by the way, all of them still hold their respective positions: President, John C. Beale; General Superintendent, J. E. Fenn; Directors—E. W. Crowell, David Solomon, J. Boorman Johnston, John C. Beale and Win. B. Watkins.

These gentlemen immediately entered into negotiations with the Committee on Fire Patrol of the New York Board of Fire Underwriters to secure a connection with that body, and arrangements were made whereby the Fire Insurance Patrol stations were constituted the terminal offices for the company's fire circuits, and since that time Mr. Watkins' invention has been employed as the most effective of recent accessions to the utility of this organization. The next few months were occupied in perfecting the system and apparatus of the company, and late in the fall of 1873 it commenced active operations.

Shortly after, the attention of the Board of Fire Underwriters being directed to this system, they, after careful investigation, became fully satisfied in regard to the benefits to be derived by the insurance interests from its general introduction, and accordingly adopted resolutions granting a reduction of insurance rates to all property protected by this company's apparatus.

Our readers are already aware that the Patrol is a body of firemen employed since 1839 by the Board of Fire Underwriters, and is an organization entirely independent of the city Fire Department. In case of fire they do their utmost to extinguish it, since the invention of Mr. Babcock's Extinguisher, by means of this contrivance; or, failing in this possibility, they protect, so far as they can, the endangered property by covering it with waterproof tarpaulins inside the building, or removing it into the street and protecting it there by the same means. It is plain that such an invention as Mr. Watkins' must be of incalculable value to this organization, and since its association with the Automatic (Fire) Signal Telegraph Company its usefulness has been greatly promoted.

An inspector in the service of the telegraph company is now to be found both night and day at every Fire Insurance Patrol, and his duties are to see to the instruments, and when a signal is given to communicate with the Patrol. He is anticipated in this latter duty, however, so far as indicating the necessity of the services of the Patrol goes, for the moment his bell commences to strike, the intelligent horses, who have stood ready harnessed, rush from their stalls, and the firemen have made ready to go out almost with the completion of the signal, which, as we shall presently see more particularly, gives not alone the street where the fire is located, but the number and which floor of the building is attacked. This is a great advance upon the capability of the Fire Department, which is yet dependent for signals altogether upon the old fashioned pole boxes, which merely indicate the district in which a fire has broken out.

But to explain more minutely by what means the wonderful results we have already indicated are brought about by the new Automatic Alarm: Let us suppose the case of a building in Broadway in connection with the Patrol in Murray street. It consists of five stories. Placed along the ceiling, at intervals of twenty-five feet in each of these stories, is a number of what are called thermostats. These are small instruments consisting of a brass tube, in which is placed a compound metallic coil, composed of two metals of unequal expansive and contractive power. By the action of heat upon this coil it expands until it touches an adjustable screw, which projects through the side of the tube. By this means a connection is formed with a galvanic battery through the wires by which the thermostat is connected with a larger instrument, called the transmitter, one of which is to be seen on every floor of the building. The electric current operating through a magnet in connection with the kind of clock work of which the transmitter partly consists, conveys a signal to the Patrol station. There slow beats of the bell indicate the street and number of the house from which the signal has come, and rapid strokes, immediately succeeding them, the floor. In short, all necessary particulars for the use of the Patrol are available in almost a flash from the time when the atmosphere of

any room in the building becomes heated to an abnormal degree. So sensitive, indeed, is the coil in the thermostat to heat that it can be adjusted to originate the signal at a temperature from 10 to 15 degrees F. higher than the average temperature of the room. Placing the thermostats in the ceiling, it is readily seen, is the best arrangement, not so much on account of the superior convenience as for the scientific reason that the heated air must ascend.

In addition to the leading advantages we have stated above, it is important to be remembered that no person can interfere with the wires in the slightest degree without giving an alarm at the Patrol station denoting the interference, not to speak of the impossibility of cutting or breaking them without detection. Any disturbance in the electric action, however occasioned, duly reports itself, and, if the cause is removable by human skill, is therefore promptly adjusted.

To practical men there can be no need of enlarging upon the eminent protection against fire afforded by the ingenious appliances furnished by the Automatic (Fire) Signal Telegraph Company. There are now in New York above two hundred and fifty business establishments in communication with their respective Insurance Patrol, and their number is being augmented at the rate of two or more per day. We are not intruding upon the province of the prophet in anticipating an (at present) incalculable use of the appliances we have treated, not alone in this city but in all great centres of population. It gives us much pleasure to make our readers in some degree acquainted with their nature and their use, and at this time it only remains for us to record our appreciation of the courtesy extended us by Mr. J. E. Fenn, Superintendent of the company whose name stands at the head of this article, in personally furnishing us with the materials necessary to its production.—*The New York Trade Reporter and Insurance Review.*

The Telegraph in Queensland, Australia.

FROM the report of Mr. W. J. Cracknell, Superintendent of Electric Telegraphs in Queensland, to the Postmaster General, made July 13, 1874, a copy of which has been forwarded to THE TELEGRAPHER, some instructive facts are derived relative to the progress of the telegraph in that colony.

He states that since the date of his last report the following extensions have been completed: From Maryborough, *via* Gin Gin, to Teneninging, a section of forty-eight miles of new line, and twenty-five miles of additional wire stretched on the existing poles between Maryborough and Gayndah.

A line from Gin Gin to Gladstone, 104 miles in length, was completed on the 27th of October last.

A line within the railway fences from Toowoomba to Dalba, fifty-two miles in length, was completed on the 24th of February last. This line consists of three wires. Iron poles are erected on the plains in order to secure the lines from the effects of atmospheric electricity, universally prevalent and destructive during the summer months on this portion of the Darling Downs.

A branch line from Gin Gin to Bundabug, 30½ miles long, was completed and opened for business on the 30th of last March.

A line from Springsine to Tambo, 144½ miles in length, was completed on May 27th.

A second wire, 177½ miles in length, has also been placed on the existing poles between Brisbane and Maryborough. This line was completed and opened on 24th of March.

All these lines are substantially built, in accordance with the usual specifications.

It will be seen from the above that the telegraph is making rapid and creditable progress in Queensland, as well as other Australian colonies. There are now in that colony 3,203 miles of line, 3,931 miles of wire, 74 stations in operation, and 181 officers permanently employed by the department. The first line erected in Queensland (25 miles in length), from Brisbane to Ipswich, was opened for public business on the 13th of April, 1861.

There are in course of construction the extension from Roma to Charleville, about 180 miles. A contract was entered into on the 4th of April for constructing a branch line of 120 miles from Roma, *via* Surat, to St. George, to be completed and handed over to the Government within eight months from the notification of the tender being accepted.

Arrangements were also entered into on the 16th of April for erecting a second wire on the line from Rockhampton to Burdekin, a distance of 493 miles. This wire is much required in order to relieve the overcrowded single line between these stations.

Other important extensions are proposed, for some of which provision has already been made and tenders for their construction invited.

The revenue of the Telegraph Department, from all sources, during the year 1873, was £27,143 11s. 1d. In this is included the value of messages on govern-

ment service, £6,386 12s. The expenditures, including refundments to other colonies of £1,811 15s. 6d., were £27,774 6s. 3d.—showing the expenditure in excess of revenue £630 15s. 2d.

156,608 messages were transmitted from the several stations during 1873, against 121,998 in the previous year—an increase of 34,610.

On the 1st of November, 1873, the tariff was reduced to a uniform rate of one shilling for ten words, exclusive of address and signature, and one penny for each additional word to and from all stations south of Bowen; press messages not to exceed half rates; and on the 10th of January last the reduced charges were extended to every station in the colony. A considerable reduction has also taken place in the intercolonial rates.

For the six months previous to the reduction of charges on the 1st of November last there were 58,542 paid messages transmitted, which produced a revenue at the rate of about £22,000 per annum. For the six months following the reduction in the charges the number of paid messages sent was 96,130—being an increase of 65 per cent. on the previous half year, for which the revenue received was at the rate of £20,000 per annum, thus showing that at present reduced charges have entailed a loss of revenue to the extent of £2,000 per annum. On the other hand, the expenditure necessary to provide for the increase of business at the principal stations is increased by about £3,400 per annum.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Duplex Review Reviewed.

NEW YORK, August 19th.

TO THE EDITOR OF THE TELEGRAPHER.

AS A certain party seems to be airing himself and his patents through the medium of your paper at others' expense, will you, on the grounds of fair play, try to make room for a few words of defence by a "poor inventor," and allow me "to excite the curiosity of your many readers" by putting in type My Review—not "of this very recent and very unaccountable proceeding of our model Patent Office"—although I might explain how to do some things there which is simply on the principle that if you want anything done *do it*; if not, send—

But of the "Duplex Review" of one party, by name G. L., C. E.

It is no wonder he cannot understand "how they do some things," etc., as he seems to forget that at the U. S. Patent Office other inventors, as well as himself, are allowed patents for new combinations, improvements, devices, etc., etc.; but he must not forget that even if he has been "over twenty years in working out" a *failure*—that he does not own other people's brains, or that he cannot prevent other people from improving even *his* failures:

MY REVIEW OF THE DUPLEX REVIEW.

G. L. claims,	F. & R. claim,
Patent, April 9th, 1872:	July 14th, 1874:
"Dots and dashes may be indicated by a blank or a colored dot or dash."	"Dots and dashes distinguished by the space left."

In this same patent he says: "My invention, as distinguished from those that have preceded it, consists in an arrangement of shunt circuits in connection with the main line, whereby the circuit of the main line *always remains closed.*"

It will be plainly evident that Mr. L. simply divides into long or short breaks what would otherwise be, as he says, a continuous dark line, these breaks representing the dots and dashes of the Morse Alphabet. It is also evident that he does not use alternate negative and positive currents upon the line, but distinctly states, "whereby the circuit of the main line *always remains closed.*" Now, he says of F. & R.—and evidently he does not know what he is writing about—"dots and dashes distinguished by the space left."

Let us see if there is the least similarity. First, in L.'s patent, he alludes to the *receiving* paper, while F. & R. describe the fillet of paper specially perforated for *transmitting* the impulses of opposite polarities to operate a repeating instrument of special construction, and only claim just what they believe to be new, and never have been known to claim, knowingly, anything else. I think there is quite a difference between the two; and, besides, I find that L. says, in a patent of September 2, 1872, "This character of perforated paper is well known;" therefore, I cannot understand why he lays such great claim to it. Can you?

Patent, July 23, 1872.

"The recording device brought into action by means of perforations in one line, and the action arrested by the other line of perforations by currents of different polarity."

July 14, 1874.

"A fillet of paper perforated in two rows, each serving to transmit currents of opposite polarity."

In this same patent of July 23, 1872, he says: "Telegraph transmitting machines, such as Siemens' and Wheatstone's, have been used, in which two lines of perforations have been employed, and at the receiving station the recording device has been brought into action by means of the perforations in one line, and the action arrested by the other line of perforations."

I would say here that this alludes to the class of instruments known as ink writers, and it is evident that it is to this kind of apparatus that L.'s patent pertains and is adapted, too, and all that he had in view. And he further says he arranges the batteries and their connections so that their action is rendered more uniform; and, besides, in his "American fast telegraph system" he does not use electro-magnets to actuate *recording devices*, or, if he does, it cannot be *fast*; and, further, in quoting from F. & R.'s patent why does he not give it correctly, and add, "for the purpose specified?"

Now, can you tell me, Mr. Editor, why this party should garble the claims of F. & R. so that what we really do is not understood, and should seek to injure his neighbors by placing them in such a false position, in such a public manner, by pretending to show that they are claiming what he has done, when he admits, in his own patents, that what he is trying to show that F. & R. does does not belong to him?

Patent, Oct. 18, 1870.

The perforated paper itself, the means for operating the extra or "neutralizing circuit."

July 14, 1874.

A fillet of paper with two rows of holes. The extra row for the purpose of discharging or freeing a telegraph line or cable of "surplus electricity."

In this same patent he says: "Efforts have been made to introduce a reverse current to neutralize the remaining portion that makes the mark, thus rendering the mark sharp and distinct instead of attenuated." This is just exactly what L. tries to do, while F. & R. do not try to do this, and do not even once mention the neutralizing of the recording current. L. further says: "When the paper intervenes the two batteries act in opposition to each other and neutralize the action of that which sends the pulsation to make the mark at the distant station," clearly proving that he is simply patenting, in his judgment, an improved method of preventing tailing; and, in fact, he further says of his patent, in his duplex review:

Patent, Oct. 18, 1870.

"In a chemical telegraph to prevent tailings or blurs. Sets forth the use of the perforated paper itself, to effect this object immediately the paper intervenes to break the circuit."

July 14, 1874.

"In a chemical telegraph to prevent tailings or blurs showing upon the line, immediately upon each and every break in the circuit. A current of opposite polarity by the perforated paper fillet."

Still further, he says in his duplex review: "Automatic chemical telegraph—two currents act in opposition to each other and neutralize the action of that which makes the mark at the receiving end of the line. The perforated paper itself being the only means for operating the recording and the 'discharging or freeing circuit.'" Again falsely alluding to his patent—not quoting from it, as he does not even mention in his patent, much less describe the "discharging or freeing a line of surplus or unavailable electricity," or of the use of a discharging battery, but simply aims to neutralize the recording current to prevent tailings or blurs, as before set forth, and he only claims just what he does. Still later, in his patent of September 2, 1873, he says: "The coil, or condenser, absorbs the extra current, or tends to produce a reverse current upon the main line as the main line pulsation ceases, thus neutralizing the direct action of the extra current."

Now, Mr. Editor, if Mr. L. had achieved or invented what we have, or what he claims to have done in 1870, he never would have thrown away his money for such a patent as this of September 2d, 1873; but, even allowing that he did attempt to do what we have done, he simply tried to do it his way, and he did not try it our way, and I cannot see but that we have a right to patent a perfect, practical method or device if he has a right to patent an imperfect, impracticable one.

I might say much more on his review of F. & R.'s claims at this point, but I will pass on, as I have lengthened too much now, I fear, and still have two or three other points.

Feb. 26, 1873.

July 14, 1874.

"Plant's condenser, or secondary battery, is pre- ing battery at the receiv-

ferable for this purpose, or the condenser, or accumulator, as in application dated Oct. 1, 1872."

ing end of a line, for the purpose of freeing a line or cable of surplus electricity."

What astouishes me, Mr. Editor, in this reference, is that any person pretending to have been over twenty years experimenting, and pretending to such great knowledge, and to be one of the "scientific," should show such ignorance as to compare a condenser to the discharging battery, as described by F. & R.

The next points are where he alludes "to the combination of the receiving and transmitting drum—two or more styluses," and fails to show for what purpose they are—and his allusion to "two or more styluses insulated from each other, etc.," and inasmuch as their uses in both cases are widely different by the different parties. I think Mr. L. is far from just or honorable in "garbling" our claims in such a manner and putting F. & R. in such a false position, and I would repeat, for the benefit of Mr. L., that "those who live in glass houses must not throw stones;" for while I do not claim to be a "walking magazine," I do claim to know a "thing or two."

Now, Mr. Editor, while it may be "notoriously patent" that G. L. owns—nothing of any value, it has not been proved to F. & R. that their claims are owned by him.

CHARLES A. RANDALL,
35 Ann street, New York, N. Y.

One of my Electro-Chemical Problems.

TO THE EDITOR OF THE TELEGRAPHER.

In reference to my duplex review of the 10th inst., permit me to call attention to the following dates relating to a portion of my many specifications (some seventy) bearing fully upon the above subject, being one of several electro-chemical problems solved by myself—namely, the problem of how to neutralize a decomposing current in the chemically prepared paper of a chemical telegraph by the aid of the single row of perforations composing the telegram itself at the transmitting end of the line, or by one or more rows of perforations, and recorded in the archives of the various governments of Europe, Asia and America, and signed by me in the following order: August, 1870; August, 1871; November, 1871; May, 1872; June, 1872; September, 1872, and February, 1873.

The above specifications, involving the use, among many other salient features fully described and shown by models, as also by elaborate drawings, of a paper fillet having one or more rows of perforations and operating one or more insulated styluses, for the purpose of completing, breaking or neutralizing circuits in a chemical telegraph using a chemically prepared strip or fillet, or a sheet of chemically prepared paper.

This one of the somewhat "paradoxical problems" presented to my mind in the early part of 1869 consisted in how to open or close an extra circuit, or to transfer or throw upon a chemical telegraph line a neutralizing or opposing current by the use only of the same single row of perforations which go to make up the telegram itself. The (in this case) single transmitting stylus itself being made to perform that extra function controlled by the perforated row of symbols in the paper fillet by opening or closing an extra circuit, or by bringing into action an extra battery, so as to act in opposition to the battery used to make the mark in the chemically prepared fillet or sheet at the receiving end of the line wire.

The above problem was practically solved by me in the early part of 1870 between the cities of New York and Washington.

In my specifications of 1872 I also describe and show that if separate reverse currents are employed the paper is made with two rows of perforations. A portion of the instrument is shown adapted to receive a message. The pen may be used upon paper in place of the ordinary stylus to mark the pulsations by decomposition in the chemical paper. Two batteries are connected, so as to make the respective currents of equal force, or the force may be varied. Positive pulsations will be sent by one line of perforations and negative pulsations by the other line of perforations, and these will be alternated according to the position of the perforations in the paper, and these pulsations are to be of a character adapted to operate the receiving instrument at the distant station. The receiving pen or stylus may also be vibrated when chemical paper is used.

Geo. Little, C. E.

The Invention and Inventors of Automatic Telegraphy.

New York, Aug. 18.

TO THE EDITOR OF THE TELEGRAPHER.

I NOTICE in your issue of the 15th instant this question by "Peter Simple," "Can you tell me who the inventor of practical automatic telegraphy in this country really is?" I am led to ask if you or "Peter"

think that any one person can honestly claim to be the inventor of automatic telegraphy, even as it exists today? I am also led further to ask if there has yet been invented and developed a practical automatic chemical telegraph system?

I am well aware that G. L., who does not know "how some things are done," etc., as well as he ought to, at least, claims to have forty-three patents, and that it is "notoriously patent" to the whole scientific world (unfortunately that does not include your humble servant) that everything belongs to him; and also claims that, "under the guidance of a mysteriously beneficent Providence, he has been made a chosen instrument" in the discovery and development of telegraphy, "thereby rendering the same practically universal"—a statement that no one but G. L. believes, and which he has failed to demonstrate.

I am also aware that the great inventive humbug from Jersey—familiarily known at the Patent Office as a "model maker"—claims to have wasted a great many "consecutive nights" in perfecting automatic telegraphy, which resulted in accomplishing just what Mr. G. Grace had been doing for a year or two.

I am also aware that he has been reissuing other people's patents, but always to himself, and, as "Peter" says, "they are numerous, but their value is not so apparent."

I am also aware of the fact that the Automatic Telegraph Company, under the Lefferts, Little, Grace, Edison patents, manage to do very good and fast telegraphing on a circuit of about 300 miles, specially constructed for the purpose, and claimed to be the most perfect line in the country; but I am not aware of any system of practical automatic telegraphy by which could be done, for instance, the every day business of the W. U. Tel. Co., over its long lines and cables, branching to all parts of this country, at the same rate of speed that they do it, or even do it at all—and until this, at least, can be accomplished, automatic telegraphy is not practical to my mind.

If this has been or can be accomplished under any present automatic system, I should like very much to know it; and if you, Mr. Editor, or "Peter," or any of your many readers will enlighten me through your columns in regard to this, "I shall not feel hurt;" in fact, "there is nobody hurt," I hope, by such a proceeding.

INQUIRER.

Telegraphic Journalism Criticised.

CINCINNATI, OHIO, August 10th.

TO THE EDITOR OF THE TELEGRAPHER.

PERMIT one who is not accustomed to taking such steps as this to offer you a few words, which you may publish if you see proper.

Telegraph operators are emphatically a class. In comparison with the other trades and professions they are not less isolated than are engineers or printers, sailors or soldiers. Anything looking to the welfare, then, of the class—anything intended, even, for the improvement of their minds or the economizing of their money, should meet with the hearty support of every operator who desires his own improvement or wishes well for his fellows. A journal, ably edited by one in sympathy with those who are expected to be his patrons; one who knows the needs of "the boys," and who is able to provide for them; one possessing not only the power to manipulate the key, but who can also, from time to time, talk to his patrons intelligibly upon the science of his profession; one who can move among his fellows in the profession as a teacher, and who, in handling his pen, can make those to whom he talks feel that he is master of his subject—who, like Tyndall, knows of what he speaks; I say a journal ably edited by such a man, and devoted to sensible articles on scientific subjects and the standard literature of the day, should be and would be generously sustained.

It does not need any great amount of capital to carry on ward to success a really meritorious journal, no odds what its peculiar bias may be. In evidence I would point to a few examples: as a political newspaper, the *New York Tribune*; as a religious paper, the *New York Witness*; as a scientific paper, the *British Philosophical Magazine*. But, while it does not need much capital, it does need a large amount of brains, and of that penetration of judgment which will enable its conductor to understand, say, to anticipate the wants of his patrons, and that depth and breadth of solid acquirements and resources which will enable him to supply them all.

Now, as you will see by the enclosed clippings, the editors of the *Plug* (our new Cincinnati journal) (?) claim to have plenty of brain power, and that they expect to have plenty of capital the motto will abundantly testify: "In pocketo put nickelo." Its editors also recommend to "the boys," as a means of saving money, to subscribe for the *Plug*. What do you think of that for journalistic ability, in view of the merits of the paper, as they are apparent on its face?

Much of the space, you will see, is devoted to slurs upon operators who happen to make mistakes in send-

ing or receiving; a portion of the rest to innuendoes, intelligible, of course, only to the operators in this office, and an insult to them. We have several ladies in the way room, who are expected to read the paper. These claimed exemption from the personal column, but their names, also, are dragged into this issue in what I suppose the editor considers a delicate manner. You will find also an evidence of the classical erudition of one of the editors in the reference to the names of the ladies, under the caption, "Ohms." "Diana was a Goddess of War, Niobe was a Goddess of Notions," etc. (The capitals are his own.) How does that tally with your classical knowledge, Mr. Editor? Nearly on a par with the latinized motto: "In pocketo put nickelo;" is it not?

But enough. Pardon for the abuse of space in the review of such stuff. Please gird your loins in honest, scholarly journalism, and when the *Plug* shall have ceased to exist, may THE TELEGRAPHER be a thriving, robust journal.

NIHIL NAMELESS.

A Step in Civilization.

THE following despatch, dated at Buenos Ayres, was received last week at Washington from the President of the Argentine Republic:

"TO PRESIDENT GRANT.

There was general rejoicing in the United States when the first submarine cable was laid. At the close of my term of office I leave my country in communication with all nations. The Argentine Republic is now at the gates of the United States. I greet President Grant.

SARMIENTO,

President of the Argentine Republic."

The fact which is thus officially announced to the world is one of universal interest. It is a step in the progress of civilization on the American side of the Atlantic, and one which is well fitted to awaken the satisfaction and pride which President Sarmiento evidently feels in the accomplishment of so great a result. It is something to mark his administration and to make it famous in all future time. The Argentine Republic is brought into immediate communication with all nations. It is no longer an isolated and remote league of South American States stretching across the continent, but a member of the great family of civilized nations, and cemented by closer ties than ever before with the interests and the intelligence of the civilized world. All that may hereafter happen to the fortunes of mankind in any country will immediately be known there, and its people will be linked by new sympathies to every other people on the globe. "The Argentine Republic," as its President well says, "is at the gates of the United States." It is also at the gates of every other nation.

We are too apt to estimate events by the noise they make, or by the material changes they produce. No doubt many a battle in the recent war of the Argentine Republic has been thought to be of far greater consequence than this opening of telegraphic communication with other nations and with distant parts of the world. But, estimated by a true standard, this latter event rises to an importance which transcends almost any other in Argentine history. Its influences will last and continue to be felt in the condition and progress of the people when that of most others will have ceased. The telegraph is a great educator of a people, and when it is connected with the wider communications of the world, it does what no other agency is able to do for diffusing information, for quickening intelligence and for promoting civilization. Knowledge feeds and strengthens the desires which it gratifies. When thus brought to a country from any part of the world, it stimulates inquiry and leads to every kind of mental activity. So will it be with the people of the Argentine Republic. They will be brought under higher influences than they have known before, and will be forced into new sympathies with all human interests and concerns. Well, therefore, does President Sarmiento announce the event to the world with congratulations and rejoicings, as the crowning glory of his closing administration, and as marking an epoch in the history of the Argentine Republic.—*The Providence Journal*.

At a meeting of the Globe Telegraph and Trust Company the accounts were adopted and much satisfaction expressed at the progress the trust had already made in the estimation of investors—the market value of the trust shares being considerably higher than those of the companies of which it is composed. A resolution was passed requesting the board to take immediate steps for bringing in the Eastern, Eastern Extension and other companies to this amalgamation, in which companies the Globe has already a large and preponderating influence. Considering the large holding of the Globe in these companies, and the fact that the directors are practically the same in each undertaking, it would appear that considerable advantage would result to the shareholders from a complete absorption of these undertakings.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, AUGUST 22, 1874.

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Back Numbers Wanted to Complete Files.

THE supply of the following numbers of THE TELEGRAPHER is exhausted, and we are desirous to obtain them to complete files of subscribers. Any one who may have either of them that can be spared will confer a great favor if they will forward the same to this office:

Vol. IX, No. 341.....	5 copies.
“ “ “ 342.....	4 “
“ “ “ 351.....	2 “
“ “ “ 352.....	1 “
“ X, “ 391.....	6 “

A Friendly Talk with our Readers and Correspondents.

We have devoted considerable space during the last three or four weeks to the discussion of certain so-called telegraphic inventions and inventors, and, we think, not unprofitably. Any supposed or pretended invention or inventor which, or who cannot stand discussion and investigation, is a fraud or an ignoramus, and the sooner effectually disposed of the better. In the cause of justice and equity it is not unfrequently the unpleasant duty of the conductor of a publication of the character and standing of THE TELEGRAPHER to expose and condemn pretensions which are not based upon a proper foundation. It is not always the case that such unfounded claims are made in bad faith, or with intention to deceive—the deceivers are very often self-deceived. For these we have sincere compassion, and, if we could properly do so, would shield them from the disappointment and mortification which must follow the demonstration of the baselessness of their claims and expectations. For those whose only aim is

to knowingly impose old and practically useless devices as new and valuable inventions, or who are guilty of the baseness of appropriating or attempting to appropriate and claim for their own the inventions and discoveries of others, we have only contempt, and experience pleasure in showing such up in their true colors. It is one of the objects of THE TELEGRAPHER to do this, and we flatter ourselves that the duty has of late been efficiently performed.

We trust that there may now for a time be a cessation of this kind of thing, and that we may be permitted to devote our columns to more pleasant if not as exciting themes. With the close of the summer season and the opening of the fall the general interest in telegraphic topics among the great body of the telegraphers of the country will revive, and we hope that our former correspondents and new ones will favor our readers with their contributions, to diversify and make more interesting the columns of the telegraphers' paper. All will be heartily welcomed, and their assistance and coöperation duly and gratefully acknowledged.

There are, undoubtedly, many topics and subjects of importance and interest, the discussion of which would add to the attractions of the paper. To develop these we must rely upon the assistance of our friends. Any suggestions in this direction will be cordially received. A contemporary thinks we devote too much space to "self-laudation." If this be so it is a grievous fault, undoubtedly, and one which we should be very happy to correct. Honest criticism of the paper we are glad to receive, and act upon, if convinced that it is correct. We have often derived benefit from such criticism, and would invite rather than repel it.

We should feel under special obligation if each of those of our readers engaged in practical telegraphy would inform us of anything occurring within their knowledge or circle of information which would be likely to interest, instruct or amuse the fraternity. It may be that more of this kind of information would increase the value and interest of the paper to the large number of telegraphers. If we do not give more space to it, it is for lack of available material. The active coöperation, in this respect, of the fraternity and others would be duly appreciated. We do not, however, regard the statement that "Tom Smith, of the Squedunk office, has dyed his moustache," or that "Peter Jenkins, of our staff, has become, by hook or by crook, the possessor of a new tile," or that "Billy Jones is a great fellow for the girls, and spends his time in cultivating his elegant side whiskery and soaping his locks for the benefit of the handsome daughter of his landlady," etc., etc., *ad nauseum*, as a style of literature calculated to either interest intelligent telegraphers or add to the dignity or influence of any publication—telegraphic or otherwise.

Those who are pleased with such trash must be too weak in their intellectual developments to appreciate anything of real value and importance; and, of course, we are not surprised when we are informed that they consider THE TELEGRAPHER too dull, and as giving too much space to scientific and other heavy reading to suit them. We regret to be obliged to recognize the fact that there are among those claiming to be telegraphers individuals so affected with lack of intellectual development or mental paralysis, as to prefer such a style of journalism, but, unfortunately, it is a fact. For this class we have no inducement to offer to secure their approbation or support. But for those who aspire to increase in knowledge and usefulness we have the vanity to believe that this paper is not published in vain, and we know that nothing would sooner cause them to fall away from and despise it than for us to permit its columns to be filled with such drivel and inanity. Innocent and harmless fun, wit and incident are always welcome, as the spice to the more solid and serious matter which must necessarily predominate; but these are essentially unlike what we have attempted to portray.

Without further extending the present friendly talk with our readers, we will conclude with a general invi-

tation to favor us with their criticism of the management of the paper, and with their coöperation with us in improving it in the future.

Telegraphic Journalism.

THE TELEGRAPHER some time since published an editorial on the subject of newspapers of the telegraphic persuasion, and after noting the demise of *The Switch*, gives a side rap and motherly note of warning to *The Operator* and *The Plug*. THE TELEGRAPHER very kindly goes on to show that in its estimation there can be but one paper, and that THE TELEGRAPHER. We don't exactly see it in that light. We do know that THE TELEGRAPHER has done and is doing a good deal of good. We have always felt kindly toward it and its success, but we do not deem it the *ne plus ultra* of telegraphic journalism. We think it has given too much of its space to advertisements and its own laudation, and consequently less consideration to other more interesting topics, when in justice to its readers it should have given more. It asserts that "it requires capital and journalistic abilities to run a newspaper." That's just it exactly. Now it strikes us that had there been any one in that office struck by the lightning of journalistic ability, and bloated with capital, so to speak, it would not have taken years to place the paper on a paying basis, and a national union to start it. We have capital—to get—from our subscribers, of which we have a goodly number. We are prepared for quite a siege, and if our friend of THE TELEGRAPHER will garnish his editorial columns with new matter, we will call things square, otherwise we shall apply to him for the stereotyped copy of his favorite theme, "The future success of THE TELEGRAPHER," and publish it once per month free of charge.

The above, from *The Plug* of August 1st, should have received attention sooner but that our exchange copy failed to reach this office, and we might never have known how severely we had been lectured had not a Cincinnati correspondent sent it to us as an illustration of his criticisms, which we print in our correspondence columns.

We regret very much that our remarks above referred to should have so greatly displeased our friends, the publishers and editors of *The Plug*. We had no intention of hurting their feelings or casting reflections upon their enterprise, which has our sincere good wishes for its success. We have shown our appreciation of *The Plug* by copying liberally from its columns, and *crediting* what we have copied.

We have never claimed for THE TELEGRAPHER that it was "the *ne plus ultra* of telegraphic journalism." On the contrary, we are quite as conscious of its defects as anybody else can be, and are striving to correct and remedy them as far and as fast as possible. We regret that our success in this respect has not been satisfactory to *The Plug*, but we are determined not to become weary of well doing, and shall continue our efforts at improvement.

That we have given a good deal of space to advertisements is true; and how long do our friends of *The Plug* suppose THE TELEGRAPHER, in its present size and form, and at its subscription price, could be otherwise maintained? The price received for THE TELEGRAPHER will not average four cents per copy, while our friends of *The Plug* charge ten cents for their small sheet, and, we presume, get it. The subscription price of THE TELEGRAPHER does not pay the actual cost of composition, press work and paper within fifty per cent., and we must either double the price or continue to offend *The Plug* by filling a portion of our space with advertisements. As for "self-laudation," it is perhaps more modest for us to say nothing; but we hope that what we have said in commendation and explanation of THE TELEGRAPHER is no more than is warranted by the facts, and that it may be forgiven us for the past and future, as we fear that we shall be compelled to repeat our offence occasionally.

But what seems to have particularly disagreed with *The Plug* is our remarks, which it misquotes: "Newspapers grow, seldom springing into immediate profitable existence, and require to insure permanence and success, capital, enterprise, energy, and, at least, some journalistic experience." We were not connected with THE TELEGRAPHER during the first four years of its publication, and, therefore, do not apply personally the sarcasm of our contemporary. We are not overburdened

with capital, as we are too painfully aware, and as for journalistic ability we leave to our readers to judge on that point; but had it not been for the capital furnished by the National Telegraphic Union the paper could never have been established, and it never paid the cost of publication until it came into the hands of its present publisher. We are willing to concede that it probably does not require a very large amount of capital to maintain *The Plug*, and as for journalistic ability, we have no doubt our friends, SELDEN and MATTOON, have sufficient for the purpose. Let us have peace.

The Conundrum Evidently too Difficult.

ANOTHER issue of the official organ has appeared, and still no attempt is made to answer the request for information in regard to the duplex invention of Mr. STEARNS, contained in a previous issue of THE TELEGRAPHER. It is evident that our editorial friend, who was so last in making the little raid upon THE TELEGRAPHER (the only one ventured upon for several years in that paper), regrets the temerity, and finds the conundrum propounded altogether too difficult to venture upon a response. The exhibition of so little knowledge of the duplex as to claim for our mutual friend STEARNS what he expressly disclaimed in his patent as the invention of SIEMENS and HALSKE, makes it appear less strange that there should be a wholesome disinclination to attempt anything further in connection with that subject. If, however, the writer has anything more to say we should be happy to hear it, and will try to give him any further information that may be required to enlighten him on the duplex inventions of Mr. STEARNS or others.

Too Many Telegraph Students Taught.

We are constantly in receipt of communications, the substance of which is a reiteration of the complaint that there are too many telegraphic learners for the benefit of those engaged in the business, and that these, as soon as they can manipulate a key or read telegraphic signals, are not only willing but eager to obtain situations at a rate of compensation which will exclude from the business those who are qualified to do credit to it by their superior ability and acquirements. There is undoubtedly a foundation for these complaints, but how the difficulty is to be remedied is not quite so easily to be ascertained. Most of our correspondents referred to have an indefinite idea that in some way a telegraphers' association will do the work, but exactly in what manner they fail to indicate. If such an association could be established, which should include a large majority of those already in the business, it would undoubtedly have an influence which would be felt in the determination of who and how many should engage in telegraphy. All attempts hitherto to establish such an organization have resulted in failure, and we do not recognize at present any such general interest in, and self-sacrificing disposition for the establishment of a new one as shall give assurance of success. The fact is, and it may as well be plainly stated, each one is waiting for some other to initiate the enterprise, and the number who would enroll themselves in the ranks, and bear the burden and encounter the personal disadvantages likely to result, is not very great. The mere ability to manipulate a telegraphic key and to read telegraphic signals is too easily acquired, and is too generally accepted as constituting an operator, to enable telegraphy to become a close corporation. Telegraph companies, railroads, and employers of telegraphic labor generally, believe that the larger the number of so-called telegraphers the more independent they are, and the more cheaply will the work be done. As an abstract proposition this is undoubtedly correct, but when we take into consideration the varied and important interests which are necessarily and unavoidably entrusted to the ability and fidelity of telegraph operators, we believe that the indiscriminate employment of low priced telegraphic labor is not really economical. In the push and hurry which characterizes the age and the American people, the

price and quantity, rather than the quality of the work done, is the chief consideration.

We agree with our correspondents mainly as to their premises, but must confess that we are as unable as they are to point out, any more than we have done heretofore, an effective remedy for the evils complained of. If any of our readers have or think they have solved this difficult problem, we should be pleased to hear from them, and to ventilate their plans and ideas through the columns of THE TELEGRAPHER, premising, however, that if merely *talking* of the advisability and feasibility of a telegraphic organization or association would have remedied the evil, it would not now have an existence. Let us then have something practical, not mere speculations as to what could, would or should be done.

Personals.

Mr. GEO. W. RAILTON, formerly of Meriton Junction, Ontario, Canada, has accepted the appointment of agent of the Great Western Railway at Buffalo, N. Y.

Mr. JOS. W. BURNHAM may still be found at his old established general railroad and steamboat ticket office, Fifth Avenue Hotel, New York. His long connection with the telegraph interests have made him well known to the telegraphic fraternity, and his deserved popularity with the travelling public generally insure him recognition and patronage, notwithstanding the efforts of the managers of the through transportation routes to prevent the sale of their tickets through private agencies.

Mr. J. D. LARCOMBE, formerly of the Syracuse, N. Y., Atlantic and Pacific office, has accepted a situation with the Western Union Company, at Washington, D. C.

Mr. GEO. C. HARPER, of Albert Lea, Freeborn County, Minnesota, desires to learn the present address of Mr. JOHN H. POWERS, formerly of Penfield, N. Y., and who, when last heard from, was in Iowa.

The Telegraph.

Congratulations.

THE President has sent the following telegrams to the Presidents of the Argentine Republic and of Uruguay, in response to their messages of congratulation on the completion of the cables between South America and other countries:

"EXECUTIVE MANSION,
WASHINGTON, August 10th, 1874. }
TO THE PRESIDENT OF THE ARGENTINE REPUBLIC.
I heartily congratulate your Republic upon the completion of the work which brings the South American nationalities into immediate communication with each other and the balance of the civilized world. It is an important step in the interests of commerce and of good fellowship between nations and peoples.

(Signed), U. S. GRANT."

"EXECUTIVE MANSION,
WASHINGTON, August 10, 1874. }
TO THE PRESIDENT OF URUGUAY.

I send the warmest congratulations on the completion of the telegraphic line that connects your country with not only the United States of North America but most of the civilized nations of the world. May this new means of communication cement the present cordial friendship into the most permanent form.

(Signed), U. S. GRANT."

Foreign Telegraphic Notes.

THE Great Eastern will next week leave the Medway for Newfoundland, with the object of laying a sixth cable from that coast to Ireland for the Anglo-American Cable Company. This will be the first occasion upon which the laying of the cable will have commenced from the American coast. Captain Halpin will again command the ship, and the chief of the electrical staff on board will be Mr. Law.

Reuter's Telegram Company announce that they are prepared to undertake the transmission of private telegrams for South America of one word and upwards at reduced rates.

After an ineffectual effort to take the first of the deep sea soundings for the Sydney and New Zealand cable the ship Challenger returned to Sydney, N. S. W., through stress of weather. Five days elapsed before she again resumed her work, the results of which were soon expected. The other cable route to which the credit of the colony is pledged has been already surveyed, and as soon as the contractors are ready to lay it from Banjowangie to the Gulf of Carpentaria they

will find the Queensland Government officials at the latter place ready to receive it and connect their land lines.

An official memorandum, dated July 27, from the Eastern Telegraph Company (Limited) states: "This company's direct cable to Lisbon is repaired, thus restoring submarine telegraphic communication with Portugal, Gibraltar, Malta, Egypt, India and the far East."

The Eastern Telegraph Company have notified that their Vigo-Lisbon cable, which was interrupted by the steamship Chimborazo last week off the river Tagus, is now repaired, so that the whole of the company's lines are in perfect working order.

The Western and Brazilian Telegraph Company (Limited) have received intimation that the land lines connecting Rio Grande do Sul with Montevideo will be open for traffic about the 30th inst. Through telegraphic communication will be thus effected between Europe, the River Plate and the west coast of South America. The anticipated delay to through messages for Montevideo, Chili, etc., occasioned by the loss of the steamship Gomas with the Rio Grande do Sul and Chuy cable will thus be obviated.

A new cable between Shetland and Orkney has been successfully laid by the steamer Caroline.

A news report from Kingston, Jamaica, of the 10th inst., states that the submarine telegraph cable between Cayenne and Demerara will not be completed before October. The cable steamship Hooper will return to London for an additional supply of cable to duplicate the line between Demerara and Jamaica.

The Telegraph in Japan.

IN a brief account of the progress of the telegraph in Japan, printed in THE TELEGRAPHER of May 30th last, it was stated that Mr. Thomas J. Larkin was the superintendent of telegraphs in that country. This was not exactly correct, as his actual position is that of assistant superintendent of telegraphs (of which class of officials there are five), with headquarters at Kobe. The position of superintendent-in-chief of Government telegraphs in Japan has been conferred upon Mr. E. Gilbert, of Glasgow, Scotland, telegraph engineer to the North British Railway Company. Mr. Gilbert, who is a practical telegrapher, is also known as the inventor of a system of electrical communication in trains, and other electrical inventions.

The Government telegraph lines of Japan extend or are being extended from Tokyo to the north of the island of Nippon, and will shortly be connected by a cable with Hakodadi, in the island of Yesso.

It was also erroneously stated in the paragraph referred to that the galvanized iron wire used was made in Japan, which is not the fact, it being imported.

Before the present telegraph staff was engaged for the Japanese lines (in 1871), Mr. Gilbert, a nephew of the gentleman who has now been appointed Superintendent-in-chief, was employed by the Government, and built the first telegraph in that country that connecting Yokohama with Tokyo, and Kobe with Osaka.

The Duplex System on Long Submarine Telegraph Cables.

IN THE TELEGRAPHER of July 18th was reprinted from *The Telegraphic Journal* the substance of a letter from Mr. C. V. De Sauty, claiming to have succeeded, after fourteen months of experiment, in solving successfully the problem of applying the duplex system to the working of long submarine telegraph cables. In the number of *The Telegraphic Journal* for August 1st, Mr. B. Smith, of the Eastern Telegraph Company, under date of Malta, July 10th, contests the impression conveyed by Mr. De Sauty's letter of priority in successfully applying the duplex to such cables. He says:

"Mr. De Sauty is to be congratulated on his success after so long a period as fourteen months of experiment. Permit me, however, to point out that Mr. De Sauty's is not the first solution of the problem of submarine 'duplex' telegraphy, as applied to long cables, as would seem to be claimed by his letter.

On my arrival at this station in June, of last year, I found Mr. De Sauty here experimenting on the matter. The instruments used at both ends were Thomson's 'recorders,' and Mr. De Sauty found, on charging and discharging the line, that a sudden jerk of the syphon took place at the home end, which he called the 'kick.' All his attempts to neutralize this having failed, on the 6th of July he returned to Gibraltar, expressing his fear that this difficulty would prove fatal to the success of the system.

After Mr. De Sauty's departure I selected one of the Company's Alexandria cables on which to experiment, as, having duplicate cables, the traffic would be less

interfered with than had the Gibraltar cable been chosen.

Foreseeing that the first subject to which attention should be directed was the 'kick,' my experiments were made with a view to ascertaining its cause and the means of removing it. This difficulty being overcome, I anticipated no obstacle to the practical application of the system to the company's lines. I eventually succeeded in readily producing or nullifying it at pleasure, and on the 22d July, 1873, I had the pleasure of informing our London Head Office that I had succeeded in working the 'duplex' system between our Malta and Alexandria stations—a distance of 911 nautical miles. As a test of the arrangement, the cable was kept connected up for the 'duplex' during the whole of the 21st of that month, for a considerable portion of which time the traffic was passing on the 'duplex' system.

Of course success on such a length of cable rendered success on any other line of approximately similar length—such as the Gibraltar-Malta cable—a mere matter of adjustment; but, in order to satisfy myself, I, at the commencement of September, transferred my arrangements to the Gibraltar cable, and had the satisfaction of reporting, on the 3d of September, that signals, as nearly perfect as possible, had been transmitted between here and Gibraltar on this system.

Nothing but lack of sufficient apparatus has prevented the system being established on the company's lines for months past.

As my experiments were made in the Eastern Telegraph Company's interests, solely at their expense, and with their cables and apparatus, I did not consider myself at liberty to make public, through your *Journal*, the means by which I had attained success; but I may incidentally mention that a full account, with a drawing of the *modus operandi*, was sent to Mr. De Sauty at the time.

I do not wish to impugn Mr. De Sauty's claims to originality, as I do not doubt his plan will be found different to mine. My object in writing is to correct the impression his letter is calculated to produce—that Mr. De Sauty was the first to successfully apply the 'duplex' system to long submarine cables."

The Pleasures of Telegraph Construction in Central America.

THE following extract from a letter just received will illustrate the comfortable pleasures of erecting telegraphic systems in Central America:

"I have just returned from a trip to Quesaltenango and Retalhuela. My nose got the worst of the journey, strongly resembling the starboard light of a passenger steamship; it was an object of remark until to-day, when it toned down about 50%, and now looks as if it had been frostbitten, or amongst fish, it is so scaly. I enjoyed the trip very much, with exception of about seven leagues of the road between Quesaltenango and Retalhuela, one half of which is a mountain pass or gorge and the other a mountain water course. My horse almost gave up the ghost in making the passage, and the mules seemed very much disgusted. Only a cat could thrive on such a road, and then, perhaps, not without a pack of bull dogs after it, to make her jump from rock to rock easily. I have the consolation of knowing that the force of the swearing which I indulged in while struggling amongst the rocks, and swimming the streams, was so great that the whole country has heard of the elegant language I gave birth to, and am in danger of being invited to do the 'cussing' for every bad road in the country. From this we started on the journey on land 4,500 feet above the sea, rising and diving each day by the thousands of feet. One day we travelled over 50 miles of pine clad hills, averaging 10,000 feet above the sea level. One of our stopping places, Los Escuentros, is a young Canada in winter time for these parts. I think the thermometer must average about 40° at night—a low temperature for people accustomed to 30 and 40 degrees higher. The country charmed me, much of it being under cultivation, and I saw plenty of wheat, potatoes and beans growing. Lake Atitlan is beautifully situated and quite attractive. I saw some of the *cafetales* (coffee estates) of the Costa Grande, but none of the celebrated *fincas* (farms). Those I saw, however, satisfied me of the extraordinary productiveness of the soil, most of the trees being actually borne down by the weight of the beans upon them. Many of these I saw must have had as much as six pounds."

RECENTLY a Michigan judge went to a neighboring town to see a man, and telegraphed back to his wife, "Have found Garland; won't be home in a week." When the despatch reached her it read, "Have found girl, and won't be home in a week." Here let us draw a veil.

It is only by the thorough study of details and their mastery that one can hope to attain eminence or position in any profession.—GRAHAM SMITH.

The Telegraphers' Mutual Benefit Association.

ASSESSMENT No. 66, ISSUED AUG. 14, 1874.

DEATH OF THOMAS A. ENGLISH AND ROBERT B. DILLON.

THOMAS A. ENGLISH (Certificate No. 1682, issued November 25, 1872) died at Covington, La., June 18, 1874, of consumption.

Robert B. Dillon (Certificate No. 2060, issued June 11, 1873) died at New Orleans, La., July 19, of consumption.

Members holding certificates numbered up to and including No. 2262 will remit for the above assessment.

By the policy adopted at the last annual meeting a balance appears in the hands of the treasurer sufficient to pay the assessment which would otherwise have been called for on one of the two deaths now announced. Only one assessment of one dollar, therefore, is called for, the other to be paid from the funds of the association. After payment of this latter claim there will be still in the hands of the treasurer, as the permanent fund of the association, about \$3,000.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

AUG.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
13	74% ... 75%	.....	.....
14	74% ... 75%	.....	.....
15	74% ... 75	.....	.....
17	75 ... 75%	.....	.....
18	75% ... 76%	.....	.....
19	75% ... 76%	15% ... 15%	.....

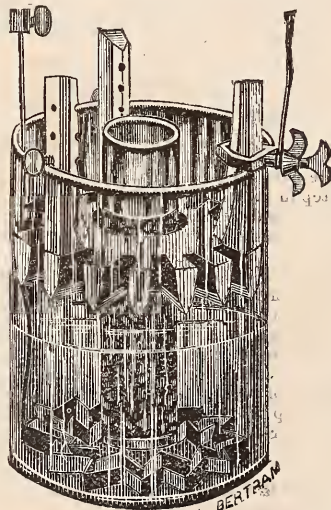
Born.

ASPINWALL.—At Troy, N. Y., Aug. 11, 1874, to C. ASPINWALL, manager of the Atlantic and Pacific Telegraph, a son.

Married.

FAULCONER—HACKETT.—At Yorkville, S. C., August 12, 1874, Mr. W. E. FAULCONER, manager of the Atlanta, Georgia, office of the Southern and Atlantic Telegraph Company, to Miss ADA E. HACKETT, of Yorkville.

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PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

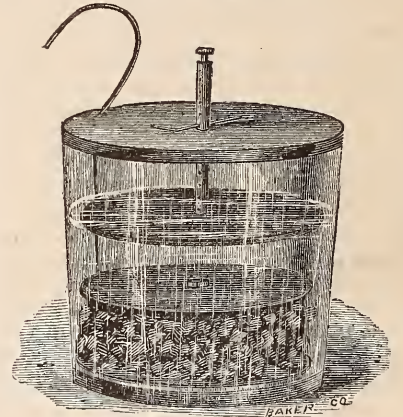
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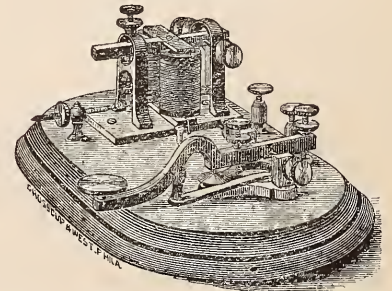
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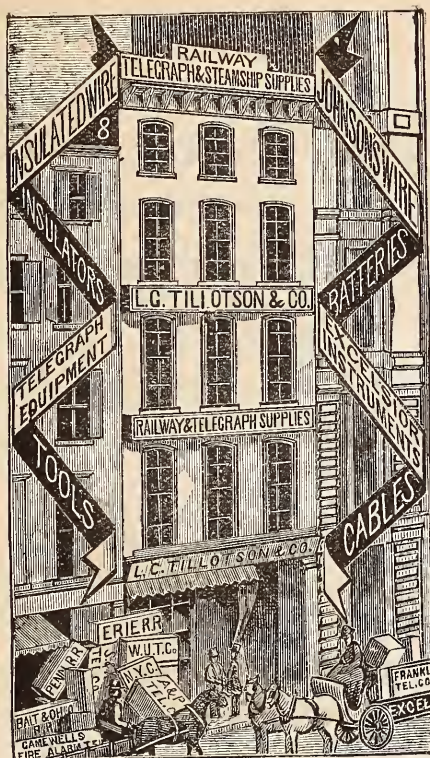
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Comprising Sounder and Key, is the greatest
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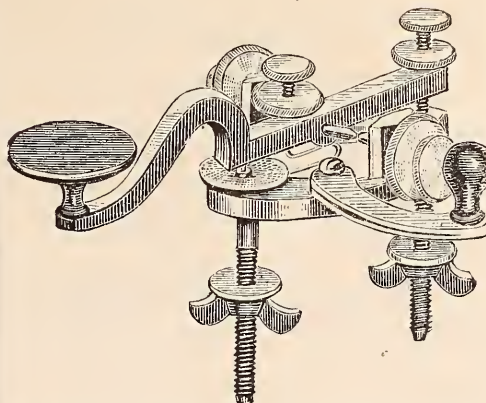
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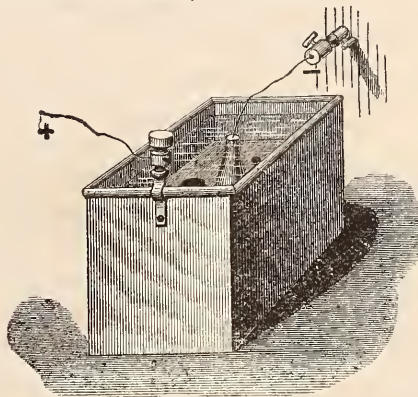
Does not keep line closed by binding against the anvil.
Will not jar open.
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Price, same as the ordinary key.
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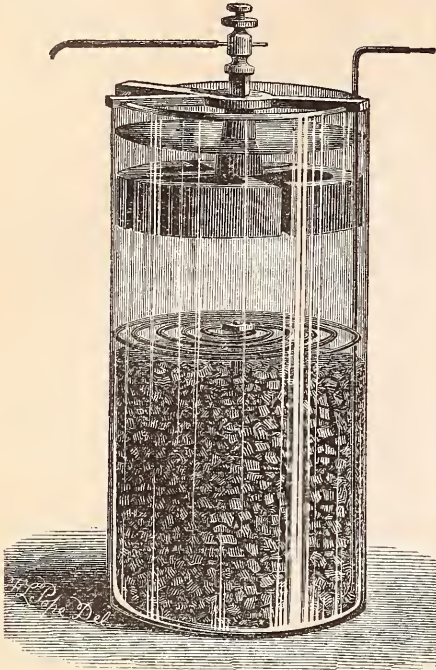
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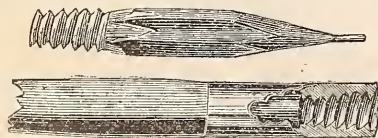
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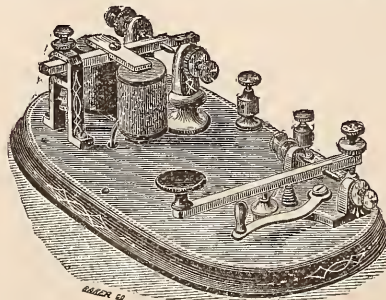
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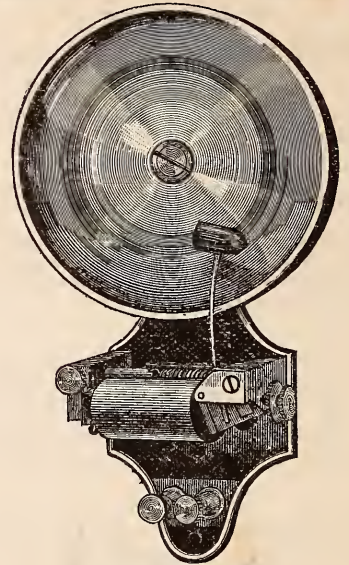
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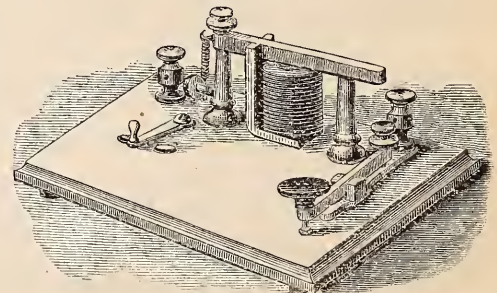
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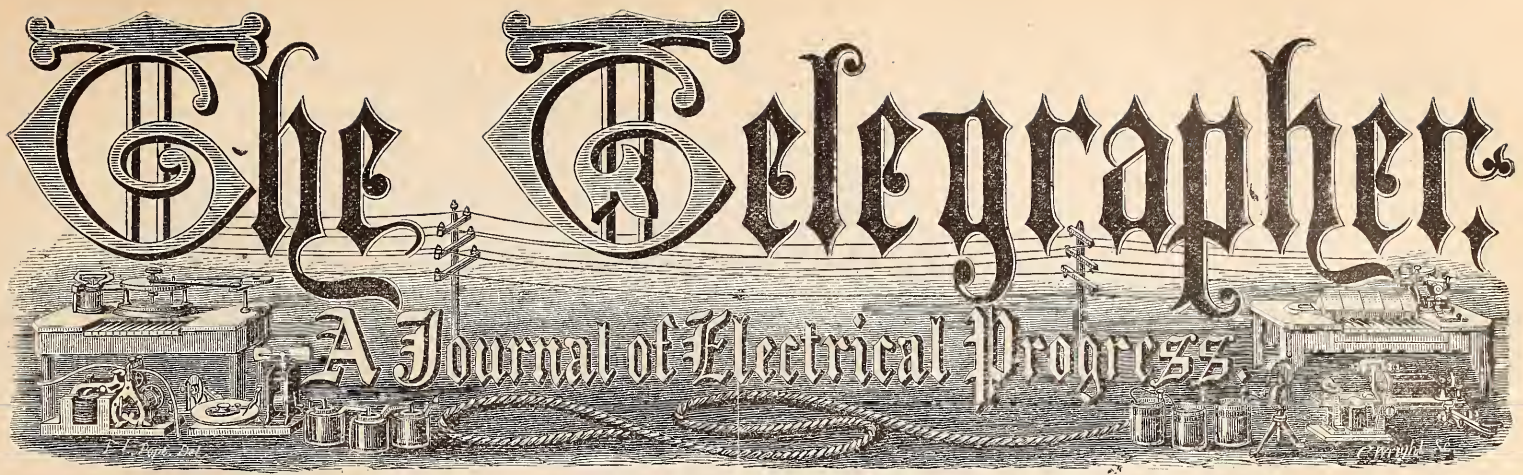
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Vol. X. New York, Saturday, August 29, 1874. Whole No. 424

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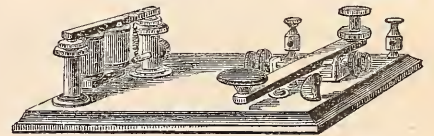
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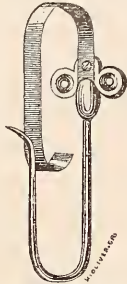
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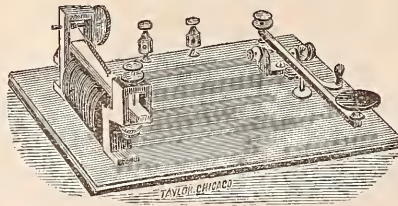
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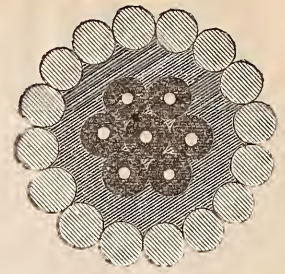
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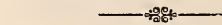
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THE TELEGRAPHER

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Original Articles.

Ferg. McClevery.

BY GNIMMUC.

JOHN OAKUM having made himself so famous as a delineator of telegraphic heroes of the olden time, it is with faltering footsteps that I attempt to follow in the path he has marked out, knowing how far I shall fall short of his inimitable pen.

I first met the subject of this sketch in the little town of New Weston, which is situate on the banks of the noble Ohio, some few miles above Cincinnati. It was in the spring of 1867, and Ferg. was at that time manager of the office. I had been sent to relieve him—he having been appointed to a position on the way circuits in Porkopolis. As I stepped into the eight by ten room consecrated to the art that Professor Morse had founded, and announced myself as the new candidate for managerial honors, Mac came forward with both hands extended, his round face dimpling with smiles, and greeted me in such a truly fraternal manner that I felt at home at once, and it was not long before we were on the very best of terms. But, alas! for human hopes, and that my fair image should be so quickly shattered, my high opinion of Fergie so soon dispelled. The next day, in answering a call from the city, I found I had McClevery at the other end of the wire, and, Holy Moses! what murdered Morse and blind guessing he made of his work. The first message was from New York. I got along all right until I came to the signature, which I put down

"Prek and Baird.

Civing Plao."

Naturally thinking this could not be exactly correct, I asked for a repetition, when, lo! and behold, with a more careful transmission from the ever careless Mac, it now came

"Peck and Baird,

Irving Place."

This was better, but my feelings were rankled by his assertion that he had sent it carefully both times, according to the second rendering; which imputation on my ability I, of course, resented with indignation, and in the language of him who was well assured of his own capacity, I replied: "If you can't write better I will report you to the superintendent." From that time forward there was a constantly growing coldness between us which, though now softened by years, there still remains a certain disdain for the man who had proved himself so ignorant on matters telegraphic, for is it not a well established fact that operators, as a class, look down with scorn on one who is a whit less able in putting down fast writing, not to speak of our contempt for those who are not able to write more than twenty words per minute, while our own nimble fingers handle the key to the tune of thirty. With what delight I used to grasp my key, proceeding to rush the life out of my genial colaborer. He used only to break me fourteen times in a ten word message (I kept an accurate account in those days; I have since given up the practice, however), but always declared it was accounted for by my mean sending, sometimes adding, "Look here, young feller, there's a cross in this wire and you come mighty shaky," both of which assertions I rejected as miserable subterfuges, for how could I, who had graduated from one of the finest telegraphic collegiate institutes in Ohio, be otherwise than perfect in all branches of the art? and why, indeed, should I, too, not feel the trouble on the line if there was any? Oh, no, the thing was not to be thought of for a minute, so I would dash on regardless of the consequences. Well, time passed, and I, thinking myself so superior in every way to Fergie, naturally thought that if he was competent to work in a city office, why, too, should not I? why, indeed? "all it requires is a little cheek and a little influence" was the uppermost thought that filled my brain, and so, flattering myself I had plenty of both to back me, wrote to the superintendent, and with a short delay I was transferred to the main office, and summoned to appear before the awful presence of the chief. I was set down to a slow wire, and managed to hold my own, as I thought, with perfect confidence. I soon found, however, that McClevery, who, by the way, had been

given the regular New York wire nights, had ingratiated himself with the authorities, and was slowly but surely, working my ruin, for reasons best known to himself. I did not give him the credit of having any ability, but I knew he had a winning way about him and a certain braggadocio air that took the place of competency. I was not long in finding out that poor I stood a very slim show in advancement, and certain hints were thrown out that I was not absolutely needed, and that the company could, on a pinch, get along without my services. I had asked for promotion to a wire where I could show my knowledge, as I felt that I was wasting my talents and losing ground by being forced to work what one of our present New York force calls a "Meguffinsville wire." This promotion was refused me, and I attributed all my ill success to the overbearing Ferg. McClevery. This opinion of mine was shortly corroborated by a conversation I overheard, which was not intended for my ears, Mac being the chief spokesman of the party. 'Tis said that "listeners never hear any good of themselves," and so it was in my case." That "Gnimuc," Ferg. was saying, "is one of the d—dest conceited chaps I ever came across; why he thinks he knows it all, and be is the biggest plug in the office. When he was up at 'Wn' he sent me a message one day going to Chillietho with the check all in a lump, 10 Paid 2.50. I told him that ought to be made a double check, when he said, 'Oh! oh! of course, yes, make it read 20 Paid 2.50.' Well, I just fainted at that, and I tried to beat it into his head that I meant to split it up, but all I got out of him was, 'Well, if you know any more about it than I do, why fix it to suit yourself,' so I made it read '10 Paid 50 & 2.00 via Cin.' as it should be, and said no more about it; and then another time I sent him a telegram from Buffalo, giving cattle markets for Jones. As it was a collect message he refused it on the score that Jones had gone to Lexington, Ky., and that he didn't want to be charged with it, and he actually asked me to send it to Lexington instead. How's that for high? I managed to get it to him with considerable wrangling, but it was a hard job I had of it, I tell you." Long before the narrator was through he was interrupted by loud guffaws, in which I saw no meaning whatever except they might be ascribed to Mac's funny way of telling anything. There was evidently nothing sharp, as far as I could see, in what he was saying. Of course, after this evidence of Ferg.'s influence over and numerous misrepresentations of me, I resigned, and left for a more genial clime, where new and better friends were found.

Callaghan.

AMONG the old timers whose names have shone forth like bright gems in the mighty West, Callaghan ranks foremost.

No one knew his full name. No one knew whence he had come or whither he went. In short, he was a mystery. Some say that he was from the "Emerald Isle," others that he was an American, and a graduate from an Eastern college.

Callaghan never spoke of his past life, and always was very reticent regarding his family affairs. Notwithstanding, however, he was well educated, and even a casual observer had every cause to believe that he was of a good family.

He was well versed in poetry, and could write an ode a mile in length at the shortest notice. He had a weakness, however, for borrowing money; and whenever he was in want of scrip he always sent a polite note, and in most cases got a polite answer. On one occasion I was the happy recipient of one of these *billet dour*, and, as I was not very rich, I could not oblige our hero with "a tenner," as he termed it. I met him next day. He looked at me and smilingly said:

"I did send to you for certain sums of gold to pay my legions." (Creditors, of course, is understood.)

I politely apologized, saying that in my present condition I was not able to oblige him.

"Oh," he said, "that's all right. Have a drink."

Whenever he came to the office—another sad case of spree—he would quote Shakspeare, Moore and Byron in the most fluent manner.

Callaghan travelled all over East, West, North and South, and after twelve years of roaming, he settled down in New Orleans, where he made himself agreeable with his vams—not that he strictly adhered to the truth—but the boys liked to hear him talk.

There was a Down-easter who used to say, "Wal, I swan! That 'ere chap Callaghan, he's the goldardest case of chin I ever kim aerost. He's wss'n my old aunt Jemimy. She talked my grandfather out'n twenty thousand dollars, which was my rightful property."

I remember on one occasion this venerable Yankee was telling our hero all about New England—its beautiful chowder, clam bakes, along with the doughnuts and rum. After he had finished, Callaghan, drawing himself up proudly, said: "Young man, I think you lie."

Brother Jonathan poured out his vials of wrath, calling Callaghan "a galvanized Mick," etc.; but he

laughed heartily and said: "Go—go show the slaves how choleric you are, and make your bondsmen tremble."

After three years in New Orleans Callaghan disappeared. No one heard of him or knew where he was. Again a mystery.

About a year after Callaghan had bidden the classic arches of the Crescent City adieu I was travelling in Georgia. I happened to be in Savannah. It was a fine spring morning; the trees were putting on their coats of green and the birds sang merrily. I strolled into the cemetery—not that I am very fond of burying grounds, but my footsteps led me there, and on a solitary tombstone I saw the following inscription:

"Sacred to the memory of our fellow operator,

CALLAGHAN.

Died January 18th, 18—"

I knew at once who it was, and shed tears of sorrow over that solitary grave. I decked it with flowers and inquired after his death. I was informed that one evening Callaghan, being in a state of intoxication, had fallen down a flight of stairs and was instantly killed. "In the midst of life we are in death."

G. O. WEST.

A Chance for Inventors.

WHILE there is reason to doubt the possibility of devising an electric motor capable of doing heavy work as economically as the steam engine, there can be no question that, for light service, a satisfactory electric engine is one of the most widely felt needs of the age.

All that is lacking to meet this want is a snitable battery; in other words, a simple, compact, portable, and, if possible, dry apparatus, capable of generating a steady current of electricity for a considerable period without renewal, capable of standing unused without material waste, yet able to give out its full power on the instant when required, capable of being easily and cheaply kept in working order, free from fumes, and not liable to leak or spill its contents under ordinary circumstances.

The applications which await such a battery are practically innumerable.

Even with the fuming, slopping, troublesome batteries already in use, enough has been accomplished with electric motors to demonstrate the superiority of electricity for light work. Everything that steam can do in such cases it can do; and there are many occasions, domestic and otherwise, where steam power cannot be conveniently employed, where a small electric engine might do the required work quickly, neatly, without heat or risk of explosion, and without calling for special engineering skill or knowledge, the common lack of which must ever act as a bar to the general employment of steam for household service. And though the power obtained may be, in itself, many times more expensive than an equivalent amount of steam power, the advantages attending the use of electricity are so pronounced, the possible saving of time and trouble so great, that, with a generator such as we have described, there would be no hesitation in giving it the preference in thousands of cases where a little power is wanted for continuous work, or where there is occasional need of a small but instant effect.

Take, for example, that almost universal household necessity, the sewing machine. How immensely would its usefulness be increased by an acceptable means of running it; a motor which would require no winding up, which would not easily get out of order, which would be always safe, always ready, and perfectly under control! A man who should devise a battery to meet this demand alone would be sure of a fortune.

But this is only one of a countless number of uses to which such a battery might be put.

In almost every civilized home there is water to pump, washing machines to operate, wood to saw, coal to lift, and a multitude of other labors, all of which might be done advantageously by simple electric motors, provided the requisite battery were forthcoming. Besides, there is light to furnish, doors and windows to guard against burglars, errands to run, and accidental fires to report. It is not impossible that the common dwelling house of the future will rival Houdin's in the diversity and completeness of its electrical appliances; yet, without entering the region of speculation, or looking beyond the simple daily needs of ordinary households, there is a present call for the services of this fleetest, neatest and most tractable of servants, sufficient to ensure wealth and renown to whoever shall capture and harness him satisfactorily.

For light manufacturing purposes the call is equally urgent. In every workshop where steam is not used there are presses, saws, lathes, drills, and numberless other present or possible machines, to which electro-motors might be profitably applied. For amateur workmen nothing could be more desirable or more likely to meet with immediate acceptance. Then what an admirable contrivance it would be for driving light wagons or propelling pleasure boats! There

would be no fuel to carry, no fire to watch, no possible explosion to fear; there would be no stabling or grooming to pay for, and no food to buy for the hours of idleness. Mr. Bergh ought to offer a premium for the invention, simply for the sake of the animals he loves.

Where the range of application is so great, it is needless to multiply examples. Our purpose is to suggest, not to demonstrate the multitudinous uses to which a satisfactory electro-motor may be put, and to call the attention of inventors to the certain reward that will come to whoever shall overcome the last remaining obstacle.—*Scientific American*.

Recent Soundings for the Pacific Cable Route.

A SPECIAL despatch from Washington to the *Boston Globe* says: Captain Belknap, commander United States steamship *Tuscarora*, engaged in deep sea soundings in the Pacific, in a report dated Hakodadi, Japan, June 26, gives an interesting and valuable account of the recent soundings. It will be remembered that he first ran a course of soundings from Puget Sound to San Diego, thence to Yokohama via Sandwich Islands. It was his intention to return on the line of the great circle, passing through the island of Sanoga, of the Aleutian group, and towards Puget Sound. He left Yokohama on his return voyage July 8, at daylight, and the next morning began sounding homeward. When about 100 miles east by south of King Kusan, or Sendai Bay, on the east coast of Japan, the lead sunk to a depth of 3,427 fathoms, showing a descent of 1,594 fathoms in a run of thirty miles. The result seemed extraordinary, especially in view of the short distance from land; but the next cast revealed a depth still more astonishing, the sinker carrying the wire down 4,643 fathoms without reaching bottom. On this occasion, when some 200 fathoms of wire had run out, the sinker was suddenly swept under the ship's bottom by a strong undercurrent, and all efforts to get the wire clear and to keep it from tending underneath were unavailing, the difficulty being increased by a fresh breeze and a moderately heavy sea.

Finally, when 4,643 fathoms of wire had run out and only about 150 fathoms were left on the reel, it broke close to the surface and about five miles were lost. After this experience Commander Belknap concluded that the currents of the Japan stream proved too strong for a hight of six or seven miles of telegraphic cable, and perhaps will render the process of laying it impossible. He, therefore, ran back in shore, in order to skirt the stream, and began now the great circle off Point Komato, in latitude 40 degrees north. On this new line he found very deep water. At one cast the sinker reached a depth of 4,654 fathoms, but with slight current. The conditions under which these latter deep casts were made were conveniently favorable. The wind was light and the sea smooth, the swell being remarkably gentle for the Pacific, and the ship was as quiet and steady as though at anchor. The wire ran straight down, and in a moment touched bottom, which was instantly and accurately known at 4,655 fathoms, or more than five miles and a quarter, as at 1,000 or 100 fathoms, the indications of the dynamometer being wonderfully accurate and unmistakably clear in all deep soundings made. On the return trip the wire broke three different times, involving a loss of fifteen miles of wire. The line will be abandoned, as it is impracticable for telegraphic cables, and a new line, close to the northern shore, will be taken up, and, if found practicable, continued to the American coast.

Uneconomical Economy in Australia.

THE Melbourne, Victoria, correspondent of the *Balarat Star*, in a communication to that newspaper, calls attention to the necessity which exists for a more rational system of management of the Telegraph Department of that colony. It seems that Mr. Langton, who has been Postmaster General for the last two years, in order to diminish the difference between receipts and expenditures of the telegraph branch of the postal service, has cut down the maximum compensation of the employes very considerably. The maximum salary of the operators has been reduced from £250 to £180 per annum, and the consequence is that the best men are leaving the department to engage in similar service in other Australian colonies, where they are more liberally compensated, much to the detriment of the service. He says:

Very recently three first class men have left the department to accept better positions in one of the other colonies. One of these men was in receipt here of £180 per annum, the maximum pay for abilities that in almost any other part of the world would be better rewarded. The Sydney Government give him £200 per annum as a minimum salary. Two other Victorian operators, one receiving £135, the other £160, go to the same colony, each receiving there £200 per annum. In fact, the policy adopted towards the service here is killing it. There is no reward for merit in this, one of the most skilled branches of the public service, and I

apprehend that in a short time the Victorian telegraphic service will rank in every respect as the lowest in all the Australian colonies. The Telegraph Department, like railways, wants at the head of it a man of practical business mind, whose efforts will be directed to maintaining the revenue by increasing the business of the department, rather than by cheeeping the salaries of able men, and making it appear hopeless to juniors of ever being able to earn a decent living by the profession they have adopted. The latest feature of departmental economy is to introduce the female element into the service, and a room is being fitted up at the office in Melbourne for them, and, as a commencement, I believe, the female staff will have charge of the suburban lines. But this system will not be perfect, it may be opined, until either a Mrs. Gamp or a Mrs. Harris is inducted into office as general manager. A gentleman connected with the department observed to me recently, "It is asked in society why don't men marry? The inquirers should come here in search of an answer. Why, we have young married men here of three or four and twenty receiving thirty shillings per week only, and, from present appearances, they will be grandfathers before they reach the maximum of £180."

The (Melbourne) *Argus* commenting on this communication, says:

"This surely is not a desirable state of affairs, and we trust that, when Parliament meets, some honorable member will make it his business to inquire into the truth of these statements. It seems almost incredible that gentlemen whose work requires the possession of considerable professional skill should be paid at a rate which would be considered shabby in the case of ordinary commercial clerks of any standing. When giving evidence in Sydney on the subject of the management and working of telegraphs generally, Mr. James and Mr. Todd stated that a good operator must be a man of special natural qualifications, and that when persons possessing the requisite gifts had been secured, it took from three to five years to render them thoroughly efficient. Is it reasonable to suppose that any one who has gone through such a lengthy training will rest content with a pittance of £180 a year, or that fitting candidates will present themselves in future for appointments which require so much and offer so little? It must not be supposed that an operator who is equal to his work at once steps into possession of the munificent salary we have mentioned. This magnificent reward of industry and patience is reserved for those who have reached the topmost branch of the tree in their own particular line."

A New Duplex Telegraph.

MR. E. C. CRACKNELL, at a recent meeting of the Royal Society of New South Wales, read a paper on the "Duplex Telegraphic Instrument." His remarks were listened to with great interest. After sketching the origin and progress of duplex telegraphy, from its first trial by Dr. Gintl, the Director General of Telegraphs in Austria, on a line from Vienna to Prague, in 1853; and briefly describing the devices of Frischem, Siemens, Halske, Stearns and others, he said:

"The arrangement before you this evening is perhaps the most simple duplex working apparatus yet devised. The two instruments are the ordinary Morse recorders, with relays, in every day use on the lines in this colony. The relays are wound with one continuous wire, and the only additions are the two vertical water columns for producing the necessary artificial resistance for dividing the currents, the actual line resistance being equal to 150 miles of wire. With this plan only one battery is employed for the line circuit, which is continuous, that is, in one direction, and the adjustment requires very little attention. It must not be understood that two distinct currents of electricity pass in opposite directions through one line of wire at the same time; but the problem has been solved by increasing the amount of current on the main circuit when signals are sent simultaneously. Although duplex telegraphy may now be considered beyond a doubt as to its practicability, we are not likely to remain satisfied with its success for any lengthened period. Mr. Meyar's ingenious invention of the multiple telegraph, exhibited in the late Vienna Exhibition, bids fair to eclipse all the telegraph instruments now in use for rapidity of signaling through one wire. This instrument has already been tried between Paris and Lyons, with four transmitters on one line, and 100 to 120 messages of average length are sent through per hour."

The Electrical Railway Alarm.

THE bell rope commonly used on our railways, while it is very serviceable for short trains, is not of much use on long freight trains, because the weight and friction of a long cord is such that the rear portion of the cord may be broken without moving the forward portion. Thus, if the coupling of the rear cars of a long freight train breaks and the train separates, no alarm

will be sounded on the engine gong, because the rear portion of the cord breaks while the front portion, to which the bell is attached, is not moved. An improvement which overcomes this difficulty consists in placing a magnetic bell hammer upon the engine, together with a small electrical battery, and in providing each car with a set of wires, joined by flexible joints, so arranged that while the train remains united all is well, but should any of the car couplings or wires break, the gong on the engine will instantly commence ringing. The same device may be employed by the conductor to give any signals that he may desire to the engineer, from any part of the train.

The Western Union Telegraph Company Opposing Telegraphic Monopoly.

THE PENSACOLA TELEGRAPH COMPANY, THE PENSACOLA AND LOUISVILLE RAILROAD COMPANY, AND THE WESTERN UNION TELEGRAPH COMPANY.

ON the 10th inst. Judge Woods, U. S. District Court, heard the application of the Pensacola Telegraph Company for an injunction against the P. and L. R. R. Co. and the Western Union Telegraph Company, and, though he did not grant the injunction, he decided that the charter granted the Pensacola Telegraph Company by the Florida Legislature, giving the company the exclusive right to erect telegraph lines in Escambia and Santa Rosa counties, is valid under the laws and Constitution of the State of Georgia. This seems to be a sufficient guarantee to the Pensacola Telegraph Company that they yet have the exclusive right to operate telegraph lines in the counties named.

The above action was in consequence of a controversy, first, between the railroad company with the Pensacola Telegraph Company, which was afterwards transferred by the P. and L. R. R. Company to the Western Union Telegraph Company. The W. U. Tel. Co. began to erect poles, etc., for a telegraph line running from Pensacola to the Pensacola Junction, and the Pensacola Telegraph Company considering their rights threatened, applied to Judge Woods for an injunction.

The curious part of all that is that the railroad company and the W. U. Tel. Co., among other things, say that the Pensacola Telegraph Company enjoy a monopoly which they desire to break up. This sounds strange, because, if it is a monopoly in the hands of the Pensacola Telegraph Co., what would it be if controlled by the Western Union Telegraph Co., the greatest monopolist in the United States?

When the State of Florida granted the charter to the Pensacola Telegraph Co., it did so to encourage a company to construct telegraph lines which were needed, and which did not promise to be a paying investment, and which would not have been built except under the guarantee of such a charter. If it is a monopoly, 'tis one that has not worked to the detriment of the City of Pensacola.

The charter of the A. and F. R. R. Co., now the P. and L. R. R. Co., is also a monopoly; yet we can't see why, if it is properly managed, it would not work to the advantage of Pensacola.—(*Pensacola Florida Weekly Press*).

Atmospheric Telegraphy.

AN interesting exhibition of telegraphic machines worked exclusively by air was recently held by Mr. Guattaris, the inventor, in the Pillar Hall of the City Terminus Hotel, Cannon street, London. A number of different instruments were on view, but the motive power in every instance was excited by the impulse given to a column of air at one end being transmitted instantaneously to the other end of the column, and taking effect upon certain mechanical arrangements so as to produce such results as might be required. The impulse is produced at one end of a tube by the operator, and performs the mechanical work at the other end either by ringing a bell or turning a needle round a dial. Mr. Guattaris claims for his invention a superiority over others in the fact a complete message can be despatched by its means. Mr. Guattaris' instruments are only worked by a single tube, along which the air is impelled in each direction. The rapidity and precision can be made equal to the electric telegraph, the conducting tube being able to be laid under or over cover in the same manner as the ordinary telegraph. Attached to each machine is a bell and dial, and the message is transmitted by the moving of a small lever, which drives the air through a pipe to the other operator. As the lever is moved up and down, the dial, which stands where the message is destined for, registers whatever the words may be. Each dial is supplied with a needle, and, as each spurt of air presses against the works of the machine, the needle is moved exactly the number of times that the lever is pressed. Each instrument can either receive or send a message. The mechanism is not likely to

become disarranged; but it appears that the invention will not transmit messages any great distance. By the aid of condensed air the inventor has succeeded in carrying a message ten miles, but without compressed air the present limit is about 400 yards. The instruments exhibited were designed for intercommunication between large coffee houses, offices, hotels and vessels.—*The Telegraphic Journal.*

Post-office Telegraphs.

IN Parliament, July 25th, in reply to Mr. McLaren, the Chancellor of the Exchequer said he was aware of the fact that the capital sum expended in the purchase and formation of the post-office telegraphs, amounting at the 31st of December, 1873, to £9,465,197, had yielded a net revenue of only £95,956, or about one per cent. on the outlay. His attention had for a considerable time been directed to the general position of the telegraph service—a subject of very great importance, involving an expenditure of great magnitude, and requiring very careful control and supervision. All expenditure upon new works or extensions out of capital had been stopped since October last, and no new works or extensions could now be undertaken except out of sums voted by Parliament. The Treasury exercised the same care and supervision in respect of the votes which might be proposed to Parliament for works in this service as in regard to any other expenditure for Government purposes. During the present year there had been very considerable strictness in revising the estimates, with a view to asking for as small a sum as possible. He was in constant communication with his noble friend, the Postmaster General, for the double purpose of keeping as low as possible the expenditure upon new works, and reducing the expenses of management, and, at the same time, of providing as efficient a system of control as possible over any expenditure connected with this service. In reference to another point referred to in the question, he had to say that since the 31st of December last the Treasury had created stock to the amount of £325,000, and that of this sum about £70,000 was still in hand. The amount expended had been applied to the purchase of works which had been taken over but not paid for. No part had been expended on extensions or new works. The honorable gentleman had asked, in conclusion, whether an estimate could be given of the probable amount which would still have to be paid to companies for telegraphs and rights acquired by the post-office. There were claims which were still under consideration and arbitration, and, therefore, in the interest of the public service it would not be desirable to give an estimate of the kind suggested.—*London Times.*

The Government Purchase of the British Ocean Telegraphs.

IN his last monthly circular, Mr. Wm. Abbott, of London, says: The proprietors of submarine telegraph property will no doubt have noticed with considerable interest that the question of the Government purchase of the British ocean telegraphs is likely to come into prominence under auspices of some influence. Mr. Reed, M. P., late constructor of the navy, has this week placed upon the notice paper of the House of Commons a motion which he will submit next session, "to call attention to the desirability of bringing British ocean telegraph lines under united and responsible public management, and in closer coöperation with the telegraphic systems of the Continent, and that a select committee be appointed to inquire and report upon the subject." There may be many and various opinions as to the policy of the purchase of these properties by the Government. International as well as imperial interests are involved in it; but there is no doubt it is high time that the question should be impartially and thoroughly investigated thus early, as delay only adds still more to the difficulties surrounding it.

Recent Advances in Electrical Sciences.

AT the session of the American Association for the advancement of Science, recently held at Hartford, Conn., Professor Lovering, the President of the Association, read an address on "Recent Advances in Science," in which he thus refers to advances in electrical science:

"Wheatstone, he said, by a revolving mirror, determined the velocity of electricity, the duration of electrical discharges, and the direction in the direction of the transmitted disturbances. Peddersen, and more recently our own associate, Rood, repeated his experiments. Indirectly the velocity of electricity thus ascertained (and the greatest known except that of gravitation) has been tested by signals through long lines of land and ocean telegraph, giving a lower figure than that of Wheatstone. But the anomaly is due to a misinterpretation. That electricity moves through a quarter of a mile of wire at the rate of 288,000 in a second is not evidence that it would move

over 288,000 miles in one second. Electricity has no velocity in the ordinary sense. The transmission of the electrical disturbance is proportional to the square of the disturbance to be travelled; therefore the velocity varies with the length of the journey."

Mr. Herring and the Telegraphs.

A PAMPHLET has been issued by Mr. Richard Herring, the patentee of a new system of printing telegraphic messages, in which the relative merits of his plan and the Morse system now in use are discussed. Mr. Herring's system, which has received the weighty endorsement of Mr. Latimer Clark, and Messrs. Clarke, Ford & Co., appears to have the following undoubted advantages over the Morse system of printing. The signals are more legible, and may be more accurately deciphered; the ordinary telegraph clerks can learn to work it with greater facility; it saves sixty-five or seventy-five per cent. in paper; as regards mechanical sending the punched paper is simpler and stronger, owing to the fewer perforations; and, finally, it is peculiarly adapted for reading by sound. Professors Thomson and Jenkins, however, have reported against the instrument on the ground that it is not adapted to work on the double current method, by which two currents are used for each symbol, and that it is more complicated than the Morse instrument. To these opinions Mr. Herring takes exception, and here the matter rests for the present. With the advantages conceded, however, there appear grounds for further inquiry into the merits of the system.—*The Railway News.*

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Common Sense Suggestions to Telegraphic Inventors.

TO THE EDITOR OF THE TELEGRAPHER.

IT has occurred to me, in reading THE TELEGRAPHER, especially during the last six weeks, that a great deal of energy was being wasted by telegraphic inventors, or those who desire to be considered and recognized as such, and persons interested in such inventions, in fighting each other, and demonstrating the baseness of each other's claims, which might be put to more profitable use. As a mere matter of priority or ownership, the public don't care a straw whether the duplex is the invention of Gintl, Siemens and Halske, Farmer or Stearns; or the automatic the invention of Wheatstone, Little, Foot and Randall, or any other man, or woman either. What is wanted is the best practical telegraphic system, which shall do the business most rapidly, reliably and economically.

As a matter of fact, it may as well be conceded at once that no great and useful invention is the production of one person or one mind. Such inventions are the aggregate result of the accretion of ideas and the operation of many different individual minds, usually at last combined and made practical by some individual who is recognized as the inventor, and whose (as it may be termed) perfected invention is subsequently improved upon by others, until it reaches as near perfection as is possible. This has been the case with the Morse, the duplex and the automatic, as is well known to all who have intelligently investigated them, and it is, therefore, the height of folly for those who are interested in automatic telegraphy to waste their time and energies in quarrelling about to whom the honor of the invention really belongs. The honor is of but little account any way—it is the profits that should be looked after.

I would respectfully submit to all the parties interested, whether it isn't time to stop this senseless wrangle, and see if they can't unite their forces and bring about a practical and general introduction of the automatic system in this country. If they do not do this they are likely to lose the substance while fighting for the shadow. The Western Union Telegraph Company, as is its custom when the merits of an invention can no longer be ignored, as shown in the case of Stearns' duplex, have at last become awakened to the real value of the automatic system, and are experimenting with a view to bringing out some automatic system which shall render them secure from injury from its introduction and extension by other and rival companies. It won't do to sneer at and decry these efforts—they will doubtless blunder along as usual—but in the end they will succeed, for they have abundant capital and can subsidize the necessary talent, when convinced that it is not now in their employ. "A word to the wise is sufficient;" but, judging from the lack of wisdom shown in this matter so far, a great many words, and hard knocks even, will be required before the automatic contestants will become con-

vinced of their folly, and realize the danger which threatens them. COMMON SENSE.

Telegraphic Journalism.

TO THE EDITOR OF THE TELEGRAPHER.

YOUR remarks on telegraphic journalism in the last issue of THE TELEGRAPHER have met with very general approval and commendation among intelligent telegraphers, so far as I have had opportunity of knowing. It is a matter of humiliation that such stuff as appears in certain so-called telegraph papers should meet with favor from the members of a profession which should be composed of intelligent and reasoning individuals. For one, I am loth to believe that the majority of telegraphers are of so low a grade of intellect as to read and enjoy such stuff, but there are evidently enough of this class to keep such publications going—for a time at least. If they were witty and amusing that would be something in their favor, but when the jokes are pointless, and the attempted witticisms witless, the result is a dreary waste of words to no purpose, unless to still further addle the already too addled individuals who read them.

Instruction, information and amusement should be combined in due proportion in a paper published by telegraphers mainly for telegraphers, and a paper which properly combines these, and is at the same time enterprising and kept fully up with the times in telegraphic matters, should meet with a liberal support. The sooner the other class ceases to exist the better.

It would, indeed, be mortifying if the world were to judge of the calibre of the telegraphic fraternity by such journals as their representatives. Fortunately they are seldom seen and more seldom read by any but the least intelligent among the telegraphers themselves, and none others outside of the telegraphic ranks would waste time upon them.

I speak earnestly and feelingly upon this matter, because as a telegrapher I have at heart the welfare and good reputation of the fraternity to which I belong, and with whom my fortunes are cast. DUPLEX.

Something About the Lake Superior Region and its Telegraphers.

MARQUETTE, MICH., Aug. 18.

TO THE EDITOR OF THE TELEGRAPHER.

AS I seldom see anything from this section in your columns, I have concluded to let the fraternity know something about those of us who reside in the greatest copper and iron region in the world.

Marquette is situated on Lake Superior, and is at nearly the same altitude as Quebec. It is the principal point for the shipment of ore by vessels to Cleveland and other Eastern cities. The Marquette, Houghton and Ontonagon Railroad extends from Marquette to L'Anse, sixty-two miles, connecting at Negaunee with the Chicago and Northwestern Railroad, passing through the richest and most prolific iron lands in the world.

I will briefly mention the operators of my acquaintance on this road. Mr. Lew. Glasin is our tram despatcher at Marquette and circuit manager, and one of the best boys that ever worked a wire. Mr. J. McCombs is operator in the Superintendent's office. Morgan Station is run by Mr. W. Wilson, a young operator of good ability, as operator and agent. Eagle Mills Station has been ornamented by Mr. Ed. B. Lerner this summer, but who resigned and left us last week, having become tired of hard times, etc. "Sx" made many friends while he was with us, and he has travelled and worked in telegraph offices from Boston to San Francisco. I presume that many will remember him. Hope he'll "strike it rich," as the miners say.

Negaunee is represented by Mr. Ned Blodgett as operator and ticket agent. He is well liked for his uniform affability. Isbpenning "V" was taken charge of last week by Mr. Nath. McComber, who relieved Mr. J. Van Brocklyu. Mac is also one of the boys. He left Greeu Bay, Wisconsin, Northwestern Telegraph Company's office, last fall, and wandered down through Texas and the Gulf States operating, teaching and other employments to procure a living, until he got round up North to take charge of "V."

Greenwood takes in Mr. Scribner; Humboldt, Mr. Mike McGee; Champiou, Mr. Tyler; Michiganmé, Mr. Lounsbury, and L'Anse Mr. Frank Wheeler; all good fellows, who can draw their pay as regularly and become impecunious again as quick as the next.

From L'Anse freight goes by boat to Houghton, and a wire follows round the shore, connecting through the great copper country of North America. The times are very dull at present, as everything here depends on the demand for and price of iron, and, as that is now quoted at about half the price that it was before the panic, it is no wonder that times are not encouraging.

That better prospects are in the near future we may safely predict. SUPERIOR.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE

TELEGRAPHIC FRATERNITY.

SATURDAY, AUGUST 29, 1874.

THE TELEGRAPHER:

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The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Back Numbers Wanted to Complete Files.

THE supply of the following numbers of THE TELEGRAPHER is exhausted, and we are desirous to obtain them to complete files of subscribers. Any one who may have either of them that can be spared will confer a great favor if they will forward the same to this office:

- Vol. IX, No. 342.....4 copies.
" " " 351.....2 "
" " " 352.....1 "
" X, " 391.....6 "

Cable Telegraph Enterprises.

THE principal activity as regards telegraphic extension at the present time is manifested in cable telegraph enterprises. There is a pause, both in this country and in Europe, in the construction of new land lines, and the additions to them the present year will be comparatively few and unimportant. The causes which have led to this in the United States are familiar to our readers. The general prostration of business interests has, for the time, checked all new enterprises, and, although in the financial centres money is in excessive supply, and is loaned on call at 2 and 3 per cent., there is not the confidence required to induce capitalists to invest their funds in such undertakings. There are indications of a revival of business to some extent this fall, but confidence is of slow growth, and it will require yet some time before there will be a complete recovery. Another consideration which prevents any very general confidence in telegraphic enterprises in this country is the quarrels and contentions of rival inventors and claimants of inventions for fast telegraphy. It is difficult to make those not familiar with telegraphic matters have confidence in any pro-

posed system so long as it is decried by interested parties, who are supposed to have a better knowledge of the true status than those who are not actively engaged in the business.

In Europe the land lines are generally owned by the Governments, and seldom prove remunerative. In Great Britain the telegraph system has cost the Government so much, and the charges for telegraphic service have been reduced to so low a figure, that the telegraphs entail a very large annual loss upon the revenues of the postal department. This was covered up for a time by illegal and unauthorized use of funds of another branch of the Post-office Department, but this is no longer possible, and no expense is now incurred for the time which can be avoided.

But there is great activity in cable telegraph enterprises, as is shown by the reports of new cables being laid and new routes opened, which appear every week in the columns of THE TELEGRAPHER. The business of manufacturing and laying submarine telegraph cables has grown to very large proportions, and the largest steamships in the world are actively employed in the service. Telegraph cable laying has been systematized and reduced to almost a mathematical certainty. In every section of the world British capital and British enterprises and skill are stretching beneath the waters of the ocean the electric cords which bind nations and peoples together.

By the time this paper reaches the reader two of the largest steamships ever built will be upon the Atlantic laden with new cables, to add to the facilities for Atlantic telegraphy already in existence. The Faraday is engaged in laying the long section between the Irish coast and Newfoundland of the cable of the United States Direct Cable Company, and the Great Eastern is on the way to lay the sixth cable of the Anglo-American Telegraph Company, which will be laid from this side—the first time that a cable has been started from the western shore to the eastward. The Great Eastern finds constant and profitable employment in cable laying, and it is to be hoped that on this trip the Faraday will redeem its character and show its adaptation to the service for which it was specially designed. Its initial performance was not very satisfactory, but this probably arose from exceptional circumstances, and we sincerely hope that its present voyage may be satisfactory and encouraging.

The laying of long submarine telegraph cables has become so common an affair that the success of such undertakings does not attract the attention and is not greeted with the enthusiasm which attended them at first, but they are not less notable and important. We should find it much more difficult to get along without the facility of ocean telegraphy, now that business and social relations have been adapted to it. If telegraphic communication between this country and Europe were interrupted for a week it would throw matters into a state of direful confusion, and would demonstrate fully to the comprehension of even the most thoughtless its paramount importance, necessity and value. Fortunately there is little probability that this misfortune will occur, and every new cable beneath the Atlantic lessens the chances of such an interruption. It has never occurred heretofore—at least one cable having been at all times serviceable.

With the completion of the Direct Cable, so called, we presume there will be, for a time at least, some competition between the new company and the Anglo-American, which has at present a monopoly of the business. What effect this will have upon the charges for the service remains to be seen, although it is understood to be the intention of the managers of the new company to reduce the rates materially. The effect of this would be to crowd the cable with business. We do not see how any very material reduction can be made profitably unless the capacity of the cable for the transmission of signals can be largely increased. The new cable will labor under the disadvantage of having to work a much larger circuit than that of either of the Anglo-American Cables, as the first relay station will be at Torbay, Nova Scotia. We do not suppose that

it is expected that the new cable can be landed at Newfoundland, at present at any rate, although efforts have been made and are still making to wrest from the Anglo-American Company its exclusive right to land cables on the Newfoundland coast. It has not been accomplished as yet, however, and as, if laid at all the present season, the new cable must be done within the next month, we do not consider it probable that it can be landed at Newfoundland this year.

The new company has met with much opposition, as, naturally, the old company does not like to have its monopoly infringed upon, but it is in a fair way to triumph over all obstacles so far as putting down the cable is concerned. It will have the good wishes of those in this country who have occasion to patronize the cables, but American capitalists are too cautious and have too little confidence to invest money in such enterprises. Our people confine their encouragement of them to using them when they must and grumbling at the charges.

If means can be found by which the speed of transmission over very long cables can be largely increased, then we may look for material and permanent reduction of rates for cable service. Those who invest their money in cables do so for profit, and not at the present time primarily for the benefit of the public. It is but reasonable that they should realize a fair profit on the investment, and in calculating what may be considered such, the character of the property and its peculiar risks and liabilities must be taken into account.

Quiet Along the Lines.

THE contest which has of late raged in the columns of THE TELEGRAPHER between the inventors, or those claiming to be inventors, and those interested with them, in systems of fast telegraphy, seems to have quieted down, for the present at least, so far as ventilating their claims and views in print are concerned. They have all had an opportunity to present their views and claims, and although undoubtedly either contestant has failed to convince the other, yet they and the public are more fully informed as to the merits of the controversy, the reasons for which lie deeper than appears to the casual observer. We do not propose to go into the matter or express any opinion upon the merits of the inventions or the validity of the claims made by either of the parties. So far as is known to us, we have the most friendly feelings towards all of them, with the exception of one notorious embezzler and appropriator of others' ideas and inventions, towards whom it is difficult to understand how any honest individual can entertain any feelings of either friendship or respect.

We believe that fast telegraphy has now been practically developed to the point when it should be introduced and made available in general use, not only on a line between New York and Washington but throughout the country. Its progress and introduction are, however, checked and delayed by the dissensions which have existed for some time past, and which recently have found expression in the columns of THE TELEGRAPHER. A communication which we print this week, over the signature of COMMON SENSE, states some important truths, and gives the parties interested some sensible warning and advice, which they will do well to heed.

If there is anything of value in the different patents and devices which have been made and secured during the last few years, why would it not be the best and most reasonable course for those interested in them to come together and combine their several interests and present a united front, so that those who must be depended upon to secure their practical introduction, can deal with them in the confidence that they are not to be victimized, or have their plans and investments possibly ruined by some contestant or contestants, who has patented an improvement which may be essential to practical success?

In this matter, as we understand it, there are two parties interested; one the inventors, or those who

claim to be inventors of improved fast telegraphic systems, and the other those who have a pecuniary interest in developing one or the other of the systems. While the latter are scheming to secure the profit which may result from the adoption of the systems or improvements in which they may be severally interested, the others are reaping no reward, or but an inadequate and insufficient compensation for their time, labor and genius embodied in their inventions. Surely it is time they should be considered, and their interests made available and remunerative.

Personally and pecuniarily, we have no interest in any system of fast telegraphy, and, as we have before stated, being friendly to all the parties concerned, with one exception, hope that what we have felt impelled to say on the subject will be duly considered and productive of good results.

Telegraph Business Improving.

WE are pleased to know that the business of the different telegraph lines is improving, and that the general improvement in business incident to the commencement of the fall trade is being felt beneficially upon the telegraph interests. The summer vacations are now nearly over, and business men are returning from their various summer resorts, and there is a more cheerful feeling generally in business circles. It is not to be expected that there will be so extensive and active a business done this fall as in the few years preceding the panic, but there is a feeling that the worst is over, and that we are to experience a permanent, though necessarily gradual improvement in this respect. The lesson of caution and economy has been a severe one, but it was greatly needed, and did not occur a moment too soon for the welfare of the whole country. The telegraph interests have suffered with the rest, but there are unmistakable indications that there is a good time coming, and that telegraphers as well as the rest of mankind may be happy yet.

Personals.

Mr. PARRISH has been transferred from Howard station, Mich. Central Railway Air Line, to Tolleston, Ind., day office, same road.

Mr. S. D. HAWTHORNE has been appointed day operator and agent at Howard station, Mich. Central Railway Air Line, *vice* Mr. PARRISH, transferred.

Mr. FRANK BARNES has been transferred from Tolleston, Ind., to Grand Junction, night office, M. C. Railway.

Mr. DOYLE has been transferred from Grass Lake, Michigan, to Three Oaks, Mich., day office, M. C. Railway, *vice* Mr. J. J. SMITH.

Mr. BOARDMAN has been appointed day operator at New Buffalo, Mich., M. C. Railway, *vice* Mr. FRANK DUNNING, resigned.

Mr. RISDORPT has been transferred to New Buffalo, Mich., night office, M. C. Railway, *vice* Mr. JAMES DUNNING, resigned.

Mr. GEO. W. COMSTOCK, formerly relief operator, has been appointed night operator, M. C. Railway, at Niles, Mich.

Mr. D. S. FLEMMING has been transferred from Niles, Mich., to Pokagon, Mich., day office, M. C. Railway.

Mr. FRANK MARSHALL has been transferred from Christmans, Ind., to Battle Creek, Mich., night office, M. C. Railway.

Messrs. FRANK and JAMES DUNNING, operators in the New Buffalo, Mich., office of the M. C. Railway, have resigned, and are attending school at Paw Paw, Mich.

The Telegraph.

By Cable.

THE NEW CABLE.

LONDON, August 22.—The shore end of the United States Direct Cable has been laid at Cahirciveen, on the Irish coast, two and a half miles Northeast of Valentia. The steamship Faraday, which is to lay the sea section, will proceed to Cahirciveen to-day.

The Brazilian Telegraph.

THE great ocean cable between Lisbon, Portugal, *via* the Azores and Rio Janeiro, Brazil, is now completed and open for business. The charges from New York to Rio Janeiro are about \$2.50 per word. The message goes *via* England, and through some eight thousand miles of submerged cables. Complimentary messages have been exchanged between President Grant, the Emperor of Brazil, the President of the Argentine Republic, and the President of Uruguay.

Last year the section of the above cable between Lisbon and Madeira was broken, and so remained until the present summer, when the two ends were fished up, joined and relaid. The depth of water at the place of fracture was 2,500 fathoms, or about 2½ miles deep, and the successful finding, raising, and joining of the broken ends at sea, shows the great perfection of mechanism and skill that has been acquired in ocean telegraph engineering.

Foreign Telegraphic Notes.

SIR DANIEL GOOCH and Admiral Richards, directors of the Anglo-American cable, visited the Great Eastern steamship, and made a final inspection of the vessel the evening before she left the Medway to proceed to execute the laying of the new cable.

Vice-Chancellor Malins has authorized a further dividend of one shilling in the pound to the creditors of the Great Oceanic Telegraph, making, with former payments, sixteen shillings in the pound.

The number of messages passing over the Cuba Submarine Telegraph Company's line during the month of July amounted to 1,758, estimated to produce £2,000, against 1,078 messages, producing £1,065 in July last year.

With reference to the Barcelona-Marseilles Cable, it is notified that the number of messages (of twenty words) passing over the line for the month ending July 31, 1874, was 6,382 against 5,451 for June.

The total number of messages forwarded from postal telegraph stations in the United Kingdom for the week ending August 1, 1874, was 408,286, an increase of 31,612 on the corresponding week of last year.

The second and third cables have been successfully submerged across the Simonosaki Straits—the former on the 14th of May and the latter on the following day—by Mr. J. Tasker Foster, the resident engineer for the Japanese Government, assisted by Captain Taylor, of the "Densinn Maru." The cables are of the same size as the shore ends of the Atlantic cables.

The Western and Brazilian Telegraph Company received on Thursday an intimation that the land lines connecting Rio Grande do Sul with Montevideo are completed and open for traffic. Communication by telegraph is thus established between Europe, the River Plate and the west coast of South America.

A grand ball was given at Rio de Janeiro, Brazil, on the 18th of July, by the Commercial Body, in honor of the establishment of telegraphic communication with Europe. Their Majesties and about 1,500 persons were present. The Emperor has decorated various gentlemen connected with the Transatlantic Cable Company.

The cable from Para to Cayenne is reported to have a defect in it which prevents practical working, and a steamer has gone to repair it. Communication with the River Plate, either by cable or land, is still incomplete, but the land lines are nearly joined, and cable to replace the wrecked section is expected out early in September.

Telegraphic and Electrical Brevities.

The lady telegraph operator at Moawequa, Ill., telegraphed that the passenger train due there at 9:15 had "left on time." After performing this duty, she immediately boarded the cars and eloped with a nice young man who parted his hair in the middle and wore a pink moustache. They rode gaily to Pana, where the nuptial knot was drawn in a lovely bow knot, and the happy pair returned on the next train. The newly made bride alighted from the cars and telegraphed, "The up train gone," thus making a bridal tour without missing a call.—*Chicago Tribune*.

The Navy Department received at Washington on Saturday, Aug. 15, its first official despatch by cable from Rio de Janeiro, Brazil. It was dated on that day, and was received at ten A. M. from Admiral Leroy.

While a number of boys were playing on the corner of Fifth street and Vernon avenue, Hunter's Point, Long Island, a telegraph pole fell down in their midst, injuring several of them, one very seriously.

The Southern and Atlantic Telegraph Company have opened an office at Fort Valley, Georgia, on the line of the Southwestern R. R. of Georgia.

The British Postal Telegraph.

IN the House of Commons, on the 27th ult., on the supplementary vote of £37,687 for the Post-office Telegraph Service, Mr. Smith explained that this vote was brought forward as a supplementary estimate in consequence of a change of practice which had only recently been introduced, and which he thought was a very desirable one. Until this estimate was presented it had been customary to charge the amount for annuities to the servants of the late telegraph company to the capital accounts, which was considered to be entirely improper. In answer to Mr. Fawcett, the Chancellor of the Exchequer said he was informed that the amount of business that was being done was largely in excess of that done last year, and that there was at present no reason to fear that the estimate which was given to him for the telegraph revenues for this year could not be realized. Lord J. Manners said that, taking last month, there were 200,000 more telegrams despatched and received than were despatched and received during the corresponding month of 1873—a gratifying proof of the immense development of this particular branch of the Post-office system. The vote was agreed to.

Death of Ex-Commissioner of Patents S. S. Fisher.

WITH the deepest regret we record the death, by drowning, on August 15, of Samuel S. Fisher, Esq., of Cincinnati, O., formerly Commissioner of Patents; the duties of which important post he performed with the most distinguished ability till the end of the year 1870, when he resigned. The accident which terminated this useful life was truly calamitous, as Mr. Fisher's son was drowned at the same time. They left Elmira, N. Y., on a summer boating excursion, intending to float down the Susquehanna to Havre de Grace, and enjoy the wonderful scenery which that river presents. The boat was unfortunately capsized in the Conewago Rapids, fourteen miles below Harrisburg.

The record of Commissioner Fisher will long survive him. His learning and practical good sense, accompanied by great force of character, gave him more than customary authority over the important department in which he presided, and enabled him to carry out many salutary reforms in the administration of the Patent Office. As a patent lawyer he was widely renowned, and many of the most important litigations were entrusted to him, and some very heavy cases were in his office at the time of his death.

Commissioner Fisher served his country in the late war as Colonel of an Ohio regiment, was President of the Board of Education in Cincinnati, and has filled many other important public positions.—*Scientific American*.

Dr. Priestley and the Voltaic Pile.

A FRIEND of the late Dr. Priestley, Hugh Bellas, Esq., wrote: "In the summer of 1800 I called on Dr. Priestley to return some books I had borrowed, when he told me he had just received a very curious present from Europe, which he would show me. He took me into his laboratory and pointed to a small pile of plates of silver and zinc, in alternate layers, with pieces of wet flannel interspersed, each plate about the size and form of a common playing card. A piece of small wire was inserted at the top, and another piece near the bottom, and the other ends of the wire were brought together, and there underwent decomposition. 'Now, this is called the pile of Volta,' said the Doctor, 'and here is the electric fluid destroying the ends of the wires. Put the joint of your thumb to these points and you will feel a slight electric shock. You need not be afraid; it will not be severe.' I did as he directed, and received successive slight shocks upon repeated applications to the points." This was the first electric machine brought to America.

Miscellaneous.

ELECTRICAL GAS LIGHTING.—One mode of lighting numerous gas jets is by the electric spark, which is the sudden passage of an electric current through an aeriform body, producing heat, light and sound. The electricity that produces a spark is of very high tension—that is, it moves with much greater velocity than the ordinary current from a galvanic battery, and hence possesses peculiar powers. This high tension electricity is generated chiefly by friction and by "induction," or the influence from a passing current in an adjacent conductor. It has little quantity, but great penetrating power, and might be compared to a bullet shot from a rifle, if a galvanic current were likened to a large stone thrown by hand. In igniting coal gas by this means, the sparks leap between the points of two wires that are brought together, but do not touch, at the orifice of the burner. The heat of the spark is sufficient to cause the ignition of the gas when this is

combined with the air, but if the spark points be entirely immersed in the pure gas, unmixed with atmospheric air, no inflammation will ensue when the spark passes, because pure coal gas is not an explosive compound, and a lighted candle introduced into an inverted jar full of such gas is as effectually extinguished as if dipped into water. When the gas is mingled with a certain proportion of atmospheric air or oxygen, it is readily and powerfully explosive.

TOOTHACHE CURED BY ELECTRICITY.—Dr. Bouchard, of Paris, says that toothache may be almost instantly arrested by a constant battery current from ten cells. The positive pole is placed against the jaw, on a level with the painful tooth, and the negative pole to the antero-lateral region on the same side of the neck.

ARRANGEMENT OF LIGHTNING CONDUCTORS.—According to the views of Mr. Preece, presented at great length in a paper read by him before the Society of Telegraph Engineers, London, the two main conditions that determine a perfect lightning conductor are—that it shall expose, in some prominent position on a building, a metallic point, and that it shall offer from this point to the earth a path of little or no resistance to the passage of the current. He also asserts that, instead of the costly copper rods, the ordinary galvanized iron wire, known as number four, and which is one fourth of an inch in diameter, is amply sufficient for the purpose, in the case of any ordinary dwelling house.

The reason given by Mr. Preece for recommending telegraphic wire is based on the experience of English companies in protecting the poles of their telegraph lines. These, it appears, are invariably supplied with lightning conductors of number eight wire, running from the upper end of the pole to the ground, and it is stated that no pole so protected has ever been known to be damaged by lightning.

Among the precautions mentioned by Mr. Preece as necessary to be observed in fixing conductors, the first is that it should be solid and continuous, there should be no joint unless it be a well soldered one, and chain-like rods, braided rope, tubing, etc., should be avoided. The ground connection, too, must be sound and good, and each conductor, if there be more than one, should have a separate ground connection, but they should also be all connected together, and connected with the lead roofing and all masses of metal in their neighborhood.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

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AUG.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
20	76% 77%
21	76% 77%
22	76½ 77%	15 15½
24	77 77½
25	77 77%
26	76½ 77%

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For the week ending July 28, 1874, and bearing that date.

153,456—ELECTRO-MAGNETIC ENGINES.—Henry M. Payne, Newark, N. J., assignor, by mesne assignments, to the American Electro-Motor Company, New York City. Filed Nov. 4, 1873.

An electro-magnetic engine in which both the cores and helices of all the electro-magnets are of concentric segmental shape, has an adjustable commutator for varying the speed.

1. The magnets A I, constructed of broken annular sections having their coils wound in reverse directions, substantially as herein shown and described.

2. The combination of the permutator wheel *o*, sheet 2, fig. 3, current wheels S S, standards T T, and lever Y, actuated by the worm *c* working in the sector *b* substantially in the manner and for the purpose specified.

153,498—ELECTRIC SIGNALING APPARATUS.—Wm. H. Sawyer, New York, N. Y. Filed April 16, 1874.

For signaling a variety of wants in "district telegraphy," the want being designated by the repetition of an arbitrary signal a certain number of times. The crank K winds the spring and releases the circuit wheel. The crank cannot be moved till the appropriate button, F P K M, is pushed in, which releases the crank lever, at the same time placing a detent, *f*, *p*, *r* or *m*, in the way of the crank lever to limit its movement, and also breaking the "cut-out" *o*, throwing the current through the sounder *s*. Shaft projects through face of box and carries a pointer for additional safeguard in showing that proper want was signalled.

1. In a telegraphic apparatus for automatic signaling the combination of the circuit breaker E (arranged to transmit a specific arbitrary signal), and a train of wheel work driven by a weight or spring for actuating the same, with the stops *f* *p* *r* *m* ar-

anged to permit said spring or weight to be wound sufficiently tight to repeat said arbitrary signal one, two or more times at pleasure, substantially as herein specified.

2. The combination of the stop *t* with the winding mechanism and the cut-out *O*, all arranged to prevent the operation of said mechanism until after the cut-out is opened, placing the sounder in the circuit, and until the rod which is to limit the travel of the arm L is put into position, substantially as hereinafter specified.

3. The combination of one or more stops, *f* *p* *r* *m*, with the cut-out lever *O* and the stop lever T (either or both), substantially as and for the purpose specified.

4. The combination of the dial plate W, index K, ratchet wheel B, pawl *c* and axis *b*, the latter being provided with a convolute spring, substantially as and for the purposes herein specified.

153,593—TELEGRAPH REGISTERS AND SOUNDERS.—Henry Middleton, Charleston, S. C. Filed Feb. 16, 1874.

+ and — currents used, E or E' being caused to move according to polarity of current; the magnet M remaining fixed different sounds are produced through the medium of sounding pieces of different metals. These sounder magnets also actuate styluses.

1. In a telegraph register and sounder two movable electro-magnets arranged to have their unlike poles turned toward each other, in combination with an immovable electro-magnet, substantially as described.

2. The movable electro-magnets E E' and E' E'' constructed with projecting soft iron cores, the ends of which are arranged to operate over the ends of the soft iron cores of the electro-magnet M M', substantially as described.

3. In a telegraph register and sounder, movable permanent electro-magnets, in combination with sounding pieces made of unlike metal, constructed and arranged substantially as and for the purpose described.

4. The sounders K K', the frame F F' and the movable electro-magnets E E' and E' E'', in combination with the wheels U and V, by means of which the sounds produced through the movements of the magnets are simultaneously signified by marks made on the paper during the passage through the machine, substantially as described.

153,613—ELECTRIC RAILWAY SIGNALS.—W. Robinson, Brooklyn, N. Y. Filed July 18, 1873.

Signal banners on and at right angles to counterpoised cross arm moved in a horizontal plane by a magnet.

1. A signal provided with two or more banners having their faces in planes parallel or at right or other angles to each other, in combination with the magnet B and suitably interposed mechanism operating and controlling said banner by means of said magnet, substantially as specified.

2. The combination of the magnet B, lever E and crank I with the cross-arm K, adapted to carry one or more banners, or a banner and counterpoise, substantially as set forth.

AUTOMATIC TELEGRAPH COMPANY.
(LITTLE'S AMERICAN SYSTEM.)

It is with pleasure that I take this opportunity to inform my many distinguished friends of both hemispheres that, after September 1st, 1874, I will be more frequently at the offices of the Automatic Telegraph Company, 64, 66 and 80 Broadway, New York.

GEORGE LITTLE,

Consulting Electrician Aut. Tel. Co. Inventor of and Patentee of the American Automatic Tel. System.

PASSAIC CITY, NEW JERSEY, U. S. A., Aug. 24, 1874.

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—:—

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TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents.
UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

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IMMENSE REDUCTION OF PRICES.

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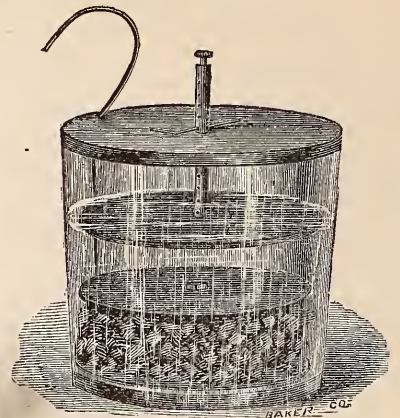
We are offering our Telegraph Instruments at 20 per cent discount from our list, or from the present published price list of any other manufacturers of first class Telegraph Instruments. Quality will be strictly maintained.

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BLISS RESERVOIR BATTERY.

PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hall or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

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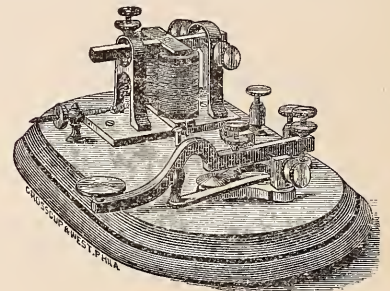
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THE PENNSYLVANIA TELEGRAPHIC AGENCY,

WAVERLY HEIGHTS, PENNSYLVANIA.

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Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

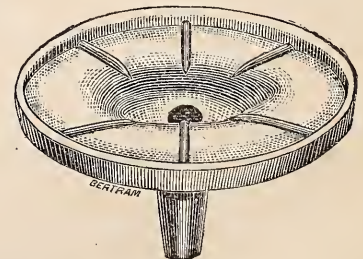
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The best Battery Insulator in use.

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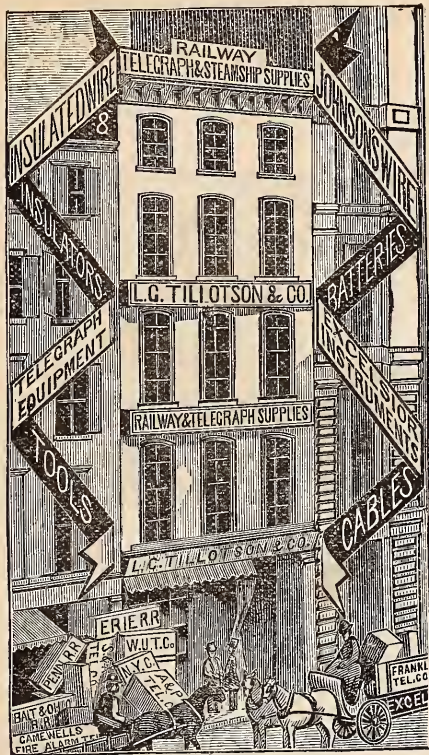
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A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

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They have the **GREATEST VARIETY.**

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Comprising Sounder and Key, is the greatest

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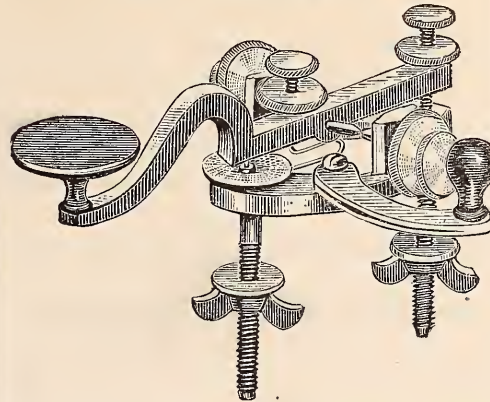
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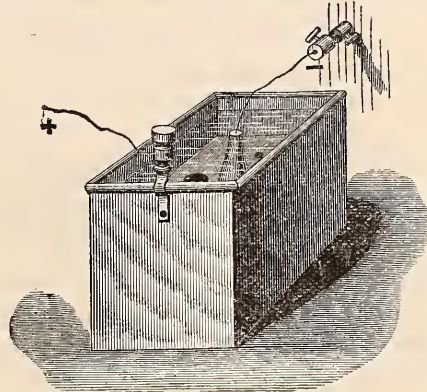
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit & cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
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SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.
Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

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now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
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RELAY, SOUNDER and KEY on same base, making an elegant set.
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HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
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First—The **Automatic Repeater**, through which this apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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Resistance Coils, Submarine Cables,
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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

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It has already been extensively adopted and has invariably given entire satisfaction.

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All instruments and work from this establishment guaranteed to give satisfaction.

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NEW AND SUPERIOR PATTERNS OF
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We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

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BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheelcr, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Buusen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Oersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, scaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

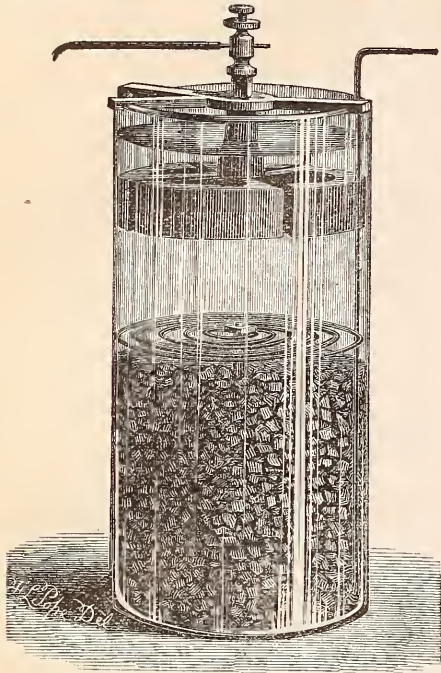
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given. The publishers will be announced hereafter.

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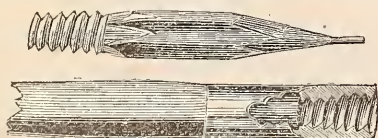
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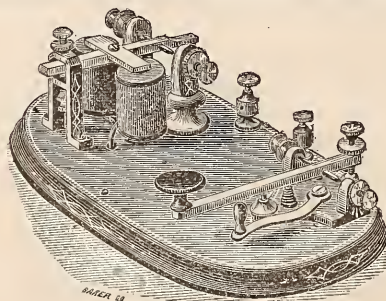
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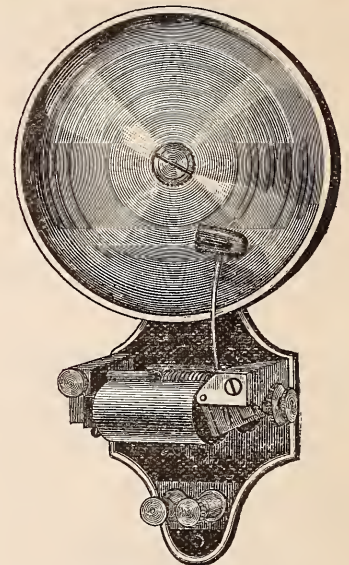
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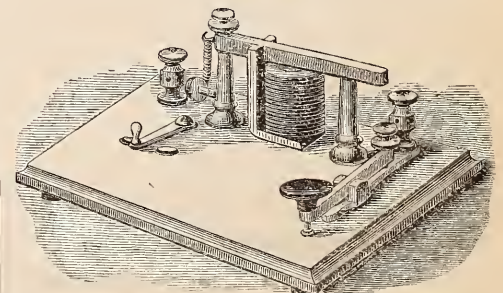
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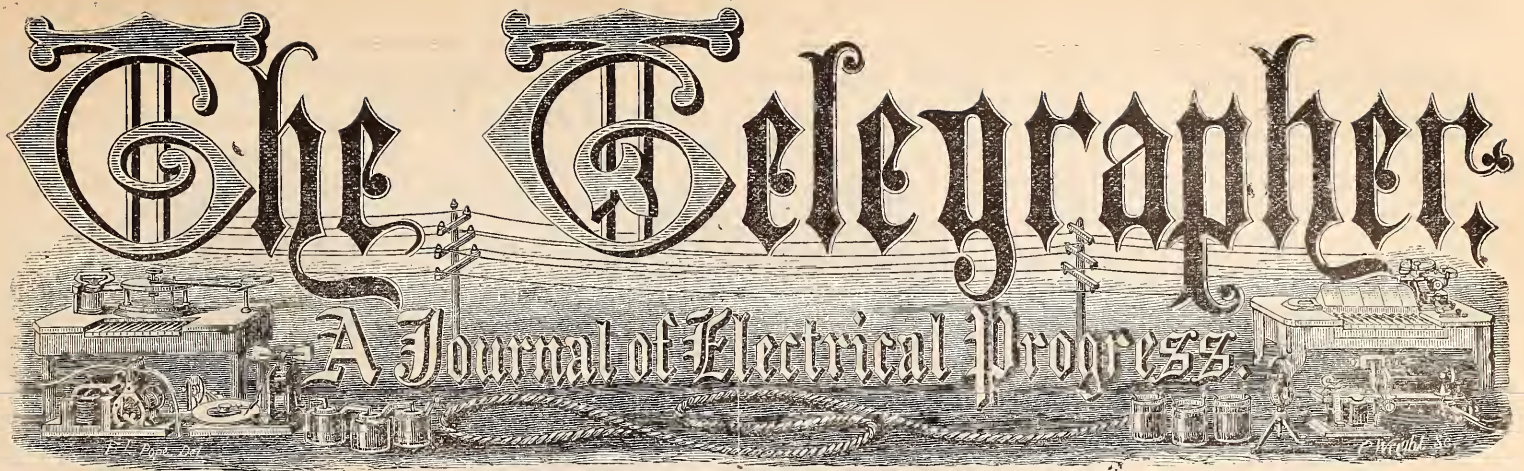
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, September 5, 1874.

Whole No. 425

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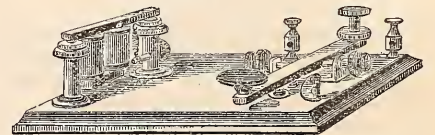
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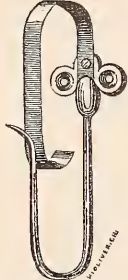
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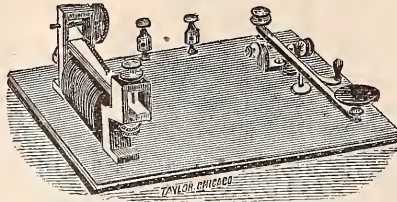
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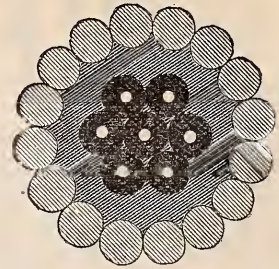
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, SEPTEMBER 5, 1874.

VOL. X. WHOLE No. 425.

Original Article.

Anders' Magneto Printing Telegraph Instrument.

UNTIL within the last two years it has not been considered practicable to use advantageously the magneto-current of electricity for operating recording or printing telegraph instruments. The difficulties to be overcome in adapting it to actuate the printing mechanism required in a printing telegraph instrument were very great, and, although many electricians and inventors had experimented with a view to overcoming these difficulties and producing a practical magneto-printing telegraph instrument, they had not met with success. At last, however, Mr. George L. Anders, of Boston, Mass., succeeded in devising such a printer, of which a general view is given in the engraving which illustrates this article. Patents have been obtained upon the invention in this country and in Europe, and it has been introduced in practical use for private and short telegraph lines, railroad and police telegraphs, etc., and has been received with marked favor and approbation.

Dial telegraph instruments operated by magneto-generators have been manufactured and used in Europe for many years, and also in this country for several years past. Mr. Anders invented and patented five years ago a magneto-dial instrument which is used quite extensively in Boston and its vicinity. In 1872, after much study and experimenting, he completed a printing instrument to operate with the same generating and transmitting machine that he used in his magneto-dial telegraph instrument. The electric current, which operates both the printer and the dial instruments, is generated by induction from permanent magnets. These magnets may be seen in the engraving projecting below the table at the right. Between the upper ends or poles of the magnets, which are of the U shape, commonly known as the horseshoe form, is a Siemens armature, which is composed of a bar of soft iron grooved longitudinally on opposite sides and wound with insulated copper wire. This armature is rotated rapidly by the motion of the treadle, and each revolution gives a positive and negative electric current, which is transmitted to the electro-magnets of the printing apparatus seen on the top of the table. Both the type wheel and the press are operated by clockwork impelled by a spring, the electric currents controlling the escapement wheels.

The type wheel is shown on the front of the apparatus, with the press or printing pad underneath, and the ink roller above it.

The paper on which the messages are printed in Roman characters is moved along between the type wheel and press by the action of the latter as each letter is printed.

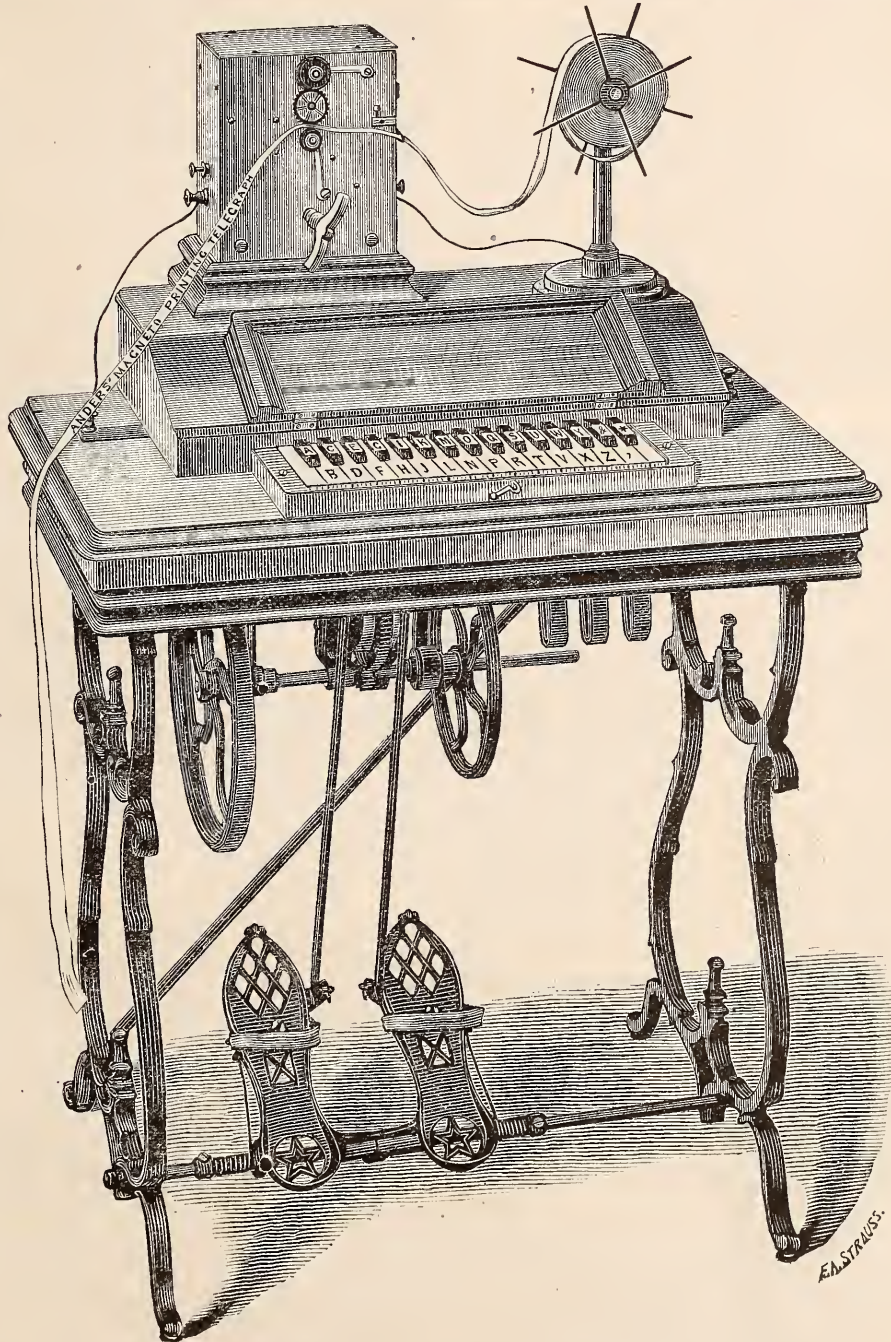
In transmitting a message the armature of the magneto-generator is rotated rapidly by the action of the treadle (which latter is easily kept in motion by one foot), and the type wheel moves with the same rapidity, it being driven by the clockwork or spring, each impulse from the generator releasing one tooth of the escapement and carrying forward the type wheel one letter. By pressing down the key having upon it the letter which it is desired to transmit and print, the circuit is broken and the type wheel arrested, the printing mechanism allowed to operate, and the letter is printed plainly upon the narrow strip of paper, as shown in the engraving. This is done quite rapidly—each instrument printing the messages sent as well as those received from other stations; and as the opera-

tion is automatic the messages are printed by the receiving instrument without requiring attention while coming.

3. Great reliability, which they state has been demonstrated by the working of the instruments on private lines in Boston and vicinity during the last year and a half.

4. Simplicity of construction, which makes it easy for persons not mechanics or professional electricians to keep them in order.

These instruments are manufactured by Messrs. Welch & Anders at 30 Hanover street, Boston, Mass., whose advertisement may be found in THE TELEGRAPHER. It is understood that they intend soon to establish an agency in this city for the sale of both their printing and dial instruments.



[From The Telegraphic Journal.]

On the New Contact Theory of the Galvanic Cell.*

By J. A. FLEMING, B. Sc., F. C. S.

THE old contact theory of Volta had its origin in an entire ignorance of the science of energy. It simply referred the current produced through the circuit of a pile to the effect of the metallic contacts, and it ignored the thermal and chemical changes which are also necessarily present; but it had to be finally abandoned when once it became clearly understood that the appearance of a current involved the disappearance of some other energy, actual or potential, as an invariable accompaniment. The new contact theory may be said to have had its source in the discovery of Sir W. Thomson, that there is undoubtedly a difference of potential produced when dissimilar metals are placed in contact—a fact not only abundantly proved by Thomson by direct experimental evidence, but, as he has pointed out, confirmed in a remarkable way by the phenomena of the Peltier effect, which, when interpreted by the dynamical theory of heat, furnish the most reliable measure of its amount. These facts, together with others presently to be referred to, have been made to furnish the key to a fresh explanation of the dynamics of the galvanic cell, which I have ventured to call the new contact theory, as opposed to the old or voltaic one.

The object of the present paper is to draw the attention of those interested in this question to the objections that may be raised against this new contact theory—objections based on facts, some old and some which perhaps may prove new, but all of which alike seem to throw fresh difficulties in the way of this theory, although capable of simple explanation by the old chemical hypothesis. It will be necessary, then, to review briefly the precise statements of this new contact theory, in order to show exactly what are the points against which objection may be taken. This will be best accomplished by collecting the statements

of its principal supporters, and arranging together their explanations of the phenomena which arise—(1) when dissimilar metals at the same temperature are placed in contact; (2) when one insulated metal is placed in a liquid capable of acting chemically upon it; (3) when two different metals are placed insulated and unconnected in one such liquid; (4) when the two metals are joined across by a metallic arc, or when two or more cells are joined up in series.

1. That the contact of metals is always attended with the production of a difference of potential between them was for a long time denied by ardent supporters of the chemical theory. De la Rive endeavored to show that the effects observed might be attributed to

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1. Entire saving of the first cost of batteries, and of all expense for material and keeping them in operation.

2. Greater rapidity in printing than has been attained

* Read before the Physical Society, March 21, 1874.

oxidation; but his experiments are not conclusive, and to Sir W. Thomson belongs the credit of having established the fact by experiment, irrespective of his theoretical deductions from the facts of thermo-electricity. He thus describes his decisive experiment: "A metal bar insulated so as to be movable about an axis perpendicular to the plane of a metal ring, made up half of copper and half of zinc, the two halves being soldered together, turns from the zinc towards the copper when positively electrified, and from the copper towards the zinc when negatively electrified." The difference of potential he finds to be about 0.6 or 0.7 of that of a Daniell's cell when the metals are perfectly clean; but by oxidation of the copper it may be made equal to or even greater than that of a Daniell's cell. He has also shown that if zinc and copper cylinders be connected by a wire, the electrometer detects a difference between the potentials of the air in the interior; and, lastly, that if copper filings be allowed to fall from a copper funnel in contact with a vertical zinc cylinder, they convey a negative charge to a receiver below. Sir W. Thomson concludes that there is sufficient evidence to show that zinc and copper attract one another chemically at any distance if connected by a fine wire, and that, as Prof. Tait remarks, "when any two bodies of different kinds are brought into contact, there is a certain amount of exhaustion of the potential energy of chemical affinity between them, and that the equivalent of this is—partly, at least—developed in the new potential form of a separation of the so-called electric fluids, one of the bodies receiving a positive, the other a negative charge, the quantity depending on the nature and form of the bodies." This is equivalent to saying that at the surface of contact there is perpetually a force tending to separate the two electricities in a direction perpendicular to that surface, while at all points ever so little within it there is no such force.

Prof. Maxwell reiterates essentially the same facts. He remarks that the electro-motive force, as determined by this method experimentally, does not account for the whole electro-motive force of a simple couple. This latter is in general far greater than that given by the Peltier effect for the same pair of metals. "Hence the greater part of Volta's force must be sought for, not at the junctions of the two metals, but at one or both of the surfaces which separate the metals from the air or other medium which forms the third element of the circuit." Prof. Jenkin, referring to these experiments of Thomson, adds that "In cases where no known chemical action occurs, as where zinc and copper touch each other, and yet difference of potential is produced, since this involves a redistribution of electricity, a small but definite consumption of energy must then occur; the source of this power cannot yet be said to be known."

2. It seems to be universally admitted that when an insulated metal is placed in a liquid capable of acting chemically upon it, a difference of potential is produced between the metal and the liquid, a sudden rise in potential taking place in passing from the metal surface to the liquid in contact with it, or that the metal becomes negatively and the liquid positively electrified, metals differing in the degree of electrification they can produce with any one electrolyte.

3. But if we ask what are the conditions when two different metals are so immersed, we find the most contradictory statements given. Sir W. Thomson expressed his opinion thus in 1862: "For nearly two years I have felt quite sure that the proper explanation of voltaic action in the common voltaic arrangement is very near Volta's. I now think it quite certain that two metals dipped in one electrolytic liquid will (when polarisation is done away with) reduce two dry pieces of the same metals, when connected each to each by metallic arcs, to the same potential"—which seems equivalent to saying that there is no difference of potential produced other than that due to dissimilar contact. Thus, also, Prof. Tait: "By interposing between two metals which have been electrified by contact a compound liquid or electrolyte, these metals are at once reduced to the same potential—a result which could not have been obtained by connecting them by any metallic conductor. By the passage of the electricity a portion of the electrolyte is decomposed, and the potential energy thus developed is equal to that possessed by the electricity while separated in the metals." Prof. Jenkin advocates essentially the same views: "When two dissimilar metals are plunged side by side into a liquid, such as water or dilute sulphuric acid, they do not exhibit any sign of electrification: the three materials remain at one potential, or nearly so. If, while the two dissimilar metals are in the liquid, they are joined by metallic contact to terminal pieces of one and the same metal, these terminal pieces will be brought to the same difference of potentials as that which would be produced by direct contact between the dissimilar metals." This amounts simply to saying that, as long as no wires are attached to the plates of a single cell there is no difference of potential; but that when wires are joined on, the observed difference of potential is due to the

contact of the wire with that metal plate to which it is dissimilar. Again: "When a single metal is placed in contact with an electrolyte, a definite difference of potentials is produced between them; zinc in water becomes negative, copper in water becomes negative, but less so than zinc. If, however, the two metals are plunged together into water, the copper, zinc and water forming a galvanic cell, all remain at one potential, and no charge of electricity is observed on any part of the system." "If a piece of copper be now joined to the zinc it (the copper) will become negative, and the other copper plate positive, the difference of potentials being that due to direct contact between the zinc and piece of copper only, the water having the effect of simply conducting the charge from the zinc to the copper plate, and maintaining them at one potential."

The foundation for these statements is found apparently in an experiment due to Sir W. Thomson. He finds that if half discs of zinc and copper be arranged under a movable metallic needle maintained at a high positive potential, if they are connected by a wire or by contact, the needle moves in such a way as to show that the copper is negative and the zinc positive; while if they are separated by a slight interval, and connected by a drop of water, no difference of potential is observed. Prof. Jenkin also lays great stress on the fact that, whereas, copper in contact with zinc becomes negative in a single cell with wires attached, it is the zinc attached to the zinc that shows a negative potential. This he holds to be conclusive that the junction of the wire with the zinc plate is the real seat of the electrical separation; although he admits that there may be a slight difference due to the liquid, and that different liquids may augment or decrease this difference.

In another place he says: "If the voltaic theory of the cell were absolutely correct, the electro-motive force of the cell would depend wholly on the plates in the electrolyte, and not at all on the solution employed to connect them." But it has been found that the potential series of the metals is slightly changed by the solution employed to join the plates; in order to account for this fact it is necessary to treat the voltaic theory as incomplete. He adds, however, that the potential series of the metals for water, dilute acids, and ammoniac chloride, do not differ so much as to invalidate the theory, although the series for alkaline sulphides is quite different and anomalous.

4. When the two plates in one electrolyte are joined by a wire, or when simple cells are joined up in series and the circuit closed by a wire, we find it stated that there is a constant separation of the electricities at the point of contact of different metals, and a constant recombination, attended with decomposition, through the electrolyte. "Perhaps it is strictly accurate to say that the difference of potential is produced by the contact, and that the current which is maintained by it is produced by chemical action." And, lastly, that in a series of cells the electro-motive force is due to the sum of the differences of potential produced by all the contacts.

(To be continued.)

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Correspondence.

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No notice will be taken of anonymous communications.

The Electromotograph.—A New Discovery in Telegraphy and "My Duplex Review."

TO THE EDITOR OF THE TELEGRAPHER.

Will you permit the insertion in your journal of the following remarks, together with my Duplex Review, in reply to a communication published in the *Scientific American* of date September 5th, 1874.

To the Editor of the *Scientific American*.

Allow me to remove the glamour from the eyes of a multitude of your intelligent readers in regard to a communication printed in your issue of September 5th, 1874, over the signature of one Thomas A. Edison, Newark, N. J., August, 1874, and prefaced with some remarks made by yourself, professing to give a description of a new discovery, the discovery in this particular instance being, for the want of a better title, called by said discoverer "the Electromotograph."

Now, I propose to take exceptions to his statements, and by so doing show to your readers that this new discoverer must be laboring under hypochondriac hallucinations.

"MY DUPLEX REVIEW."

<p>What you said.</p> <p>That, 1. Within the past few days, we have had under examination, in practical operation in our office, a novel electric telegraph apparatus, which presents some very remarkable features, and promises to result in the creation of an entirely new and advantageous system of telegraphy. It is the discovery of Mr. Thomas A. Edison, of Newark, N. J., who is well known as a telegraph engineer of the highest ability, and the inventor of a larger number of electrical devices, probably, than any other person living. His improvements are employed upon all the various telegraph lines in this country.</p>	<p>What I say:</p> <p>That, 1. On the twenty-third day of April, 1873, "a well known telegraph engineer, of the highest ability," set sail, per steamer Java, for Great Britain, and endeavored, on his arrival, to pass off on the British telegraph department my American automatic fast system of telegraphy as his own discovery and invention. Falling in this, he put himself forward as my agent, but was not accepted. Officially signed documents in relation to this mode of procedure being in my possession from her Majesty's Postal Telegraph Department.</p>
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<p>2. The present discovery relates to that form of apparatus known as the automatic or chemical telegraph, in which signals are made and recorded by causing the electricity to pass through paper, the latter being saturated with a chemical substance, which changes in color when the current acts. Lines, dots and dashes are thus produced with great facility. In the ordinary working of this form of telegraph, the electricity is sent over the line wire by a key, in the usual manner, and passes through a pen, stylus or lever, which has no movement, but simply rests upon the paper; the latter being moved by a weight or clock-work. No magnet and armature are used.</p>	<p>2. I beg to refer my friend, Mr. A. E. Beach, to my patents of 1871, 1872, 1873, and also the specifications signed by me in the following order: October, 1871; February, 1872; March, 1872; April, 1872; and February, 1873. By virtue of which I hold a broad claim to a moving lever, pen or stylus, set in motion by a mechanical force, or by an electro-motive force, and conveying an inductive current or currents for electro-chemical automatic telegraph operations.</p>
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<p>3. The salient feature in Mr. Edison's present discovery is the production of motion and of sound by the pen or stylus, without the intervention of a magnet and armature. By the motion thus produced, he works any of the ordinary forms of telegraph printing or sounding instruments or relays, and is enabled to send messages by direct transmission over thousands of miles of wire, at the highest speed, without re-writing, delay or difficulty of any kind. More than this, his apparatus operates in a highly effective manner, under the weakest electric currents, and he is able to receive and transmit messages by currents so weak that the ordinary magnetic instruments fail to operate or even give an indication of the passage of electricity. Thus, when the common instruments stand still, owing to weakness of current, the Edison telegraph will be at work up to its fullest capacity.</p>	<p>3. The Hon. George Harrington, the President of the Automatic Telegraph Company, in his official circular of March 10th, 1872, says "this great desideratum has been accomplished by Mr. George Little, whose method of manipulating the electrical currents permits telegraphing to be done automatically, and reduces the demand for capital and the current expenses to a minimum, with results of immense magnitude" (at the same time doing away with the defects of the Morse instrument, that may be interpreted by any Morse expert by feel, taste or by sound). * * * "Little's automatic telegraph process." * * * To my mind the experiments were very satisfactory. * * * Any desired length of circuit can be worked. * * * From my long practical knowledge of the wants of the press, and the defects of the Morse system of telegraphy, it seems to me that I cannot</p>
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recommend the new system too strongly.—George B. Hicks, general agent of the Western Associated Press, Cleveland, Ohio, December, 1869.

* * * Can do 200 to 2,000 words per minute from Charleston, S. C.—Harry Bertram, manager Automatic Telegraph Company, Washington, Nov. 27th, 1872.

As an illustration of its value and reliability it may be stated that, on several occasions during the past twelve months, in stormy weather, when communication was interrupted over the routes covered by the wires of the Automatic Telegraph Company, upon the lines of companies competing with the Western Union Company the business of these companies was transmitted by this system (as a favor on the part of the Automatic Telegraph Company), which works equally well, if not better, during such storms, as would seem to render other systems unreliable and sometimes useless, as under ordinary conditions.—THE TELEGRAPHER, Dec. 28th, 1873.

What T. A. Edison says :
To the Editor of the Scientific American.

1. In my new system of telegraphy, it would seem that power was obtained or that electricity had been passed into a new mode of motion, as with magnetism.

2. The electricity, acting by electrolysis, changes the nature of the surface of the paper, either by depriving it of some constituent, or the hydrogen, in conjunction with the metal and paper, form substitution compounds.

3. In trying to ascertain what caused the lever to move, whether it was by reducing the lead by hydrogen to a finely divided powder that acted as a lubricant, or whether the nature of the surface of the lead were changed by the absorption of hydrogen, like palladium, or whether the effect were due to the effort of the gases to escape from under the lever, I was led away from these notions by finding that platinum, with sulphate of quinine, will likewise show the movement. It then struck me that the nature of the paper was changed by the electrolysis.

4. I then passed the strip into the electro-motograph (I use this name for the want of a better one), the colorations being in a direct line with the lead point. On rotation of the drum, and when no coloration was under the lead point the lever was carried forward by the normal friction of the paper. But the moment a coloration passed under it, the lead point slid upon the paper as upon ice, the friction was greatly reduced, and the lever moved in an opposite direction to the rotating drum.

5. In this experiment no battery was connected to the instrument. This proves that electrolysis produces a change in the nature of the paper.

6. Afterwards found that, if a tin pen were used to receive the message from Washington, although no marks were seen, the paper appearing unchanged, yet, on passing the paper through the instrument, the movement of the lever was more marked than before. Receiving the message with a lead pen did not give so good results, although lead is the best when used, standing at the head of the twelve metals tried. The next is thallium. On paper moistened with aqueous solution of pyrogallous acid tin is as good as thallium. Of all the solutions yet tested, potassium hydrate has been found to give the most marked results. The second best is sulphate of quinine. Third, rosaniline ox-

idized and discolored by nitrous acid.

A peculiarity of the quinine solution is that platinum shows an action, and shows it when either oxygen or hydrogen is evolved on its surface. With hydrogen the friction is lessened, as with all other metals; but with oxygen the friction is increased. This is so with all the metals subject to oxidation; but it appeared strange, at first, that it would show with a metal upon which the nascent gases had no effect.

With a lead point and a solution of the disinfectant known as bromo chloralum, the evolution of hydrogen increases the friction of the paper enormously.

Silver seldom shows a movement with any solution; and when it does, it is very weak.

7. It appears to be a matter of indifference as to the character of the metal used for the drum, which acts as one of the decomposing electrodes. Considering that the lever will close a secondary circuit under the great pressure used upon the lever, its sensitiveness to electricity is wonderful. With a delicately constructed machine, moved by clockwork, which I have nearly finished, I have succeeded in obtaining a movement of the lever sufficient to close the local circuit with a current (through one million ohms, equal to 100,000 miles of telegraph wire) which was insufficient to discolor paper moistened with potassic iodide, or move an ordinary galvanometer needle. Messages may be read from the sound of the lever, when the most delicate telegraph magnet shows no current.

8. The uses of this instrument are many; in fact, it gives an entire new system to telegraphy.

9. As no secondary currents are generated, as with an electro-magnet, to prevent the instant magnetization or demagnetization of the iron cores, and electrolysis being instantaneous, it is obvious that the lever will respond to signals transmitted with great rapidity. I have succeeded in transferring signals from one circuit to another at the rate of 650 words per minute; hence, it may be used to repeat the rapid signals of the automatic telegraph into secondary circuits.

By attaching an ink wheel to the extremity of the lever, opposite a continuous strip of paper moved by clockwork, messages transmitted at a speed of several hundred words per minute may be recorded in ink. By attaching a local circuit to the repeating points, and adding thereto a sounder, it may be used as a Morse relay to work long lines of telegraph.

With regard to this alleged discovery of electro motion, Professor Faraday said, twenty years since, of this force, in his experimental researches, series xvii: "That a force which is able to overcome the resistance of a conductor, good or bad, through which the current passes, and that again by the electrolytic action, where bodies are decomposed by it, can arise of nothing; that without any change in the acting matter, or the consumption of any generating force, a current can be produced, which shall go on for ever against a constant resistance, or only be stopped as in the Voltaic trough, by the ruin which its exertion has heaped up in its own course. This, indeed, would be a creation of power, and would be like no other force in nature."

We have many processes by which the form of the power may be changed, that an apparent conversion of one into the other takes place, but in no case is there a pure creation of power or force; a production of power without the corresponding exhaustion of something to supply it."

Electro chemical decomposition sets out with a force or power of electro motion, the existence of which is "preproved," its variation assuming nothing which is not supported by some corresponding, simple chemical fact—instead of being the firm, unchangeable thing as first supposed by "Volta, in 1796," is as variable as chemical force itself—were it otherwise, the equality of cause and effect must be denied, then would perpetual motion be also true.

My scientific friend, Mr. Alfred E. Beach, in the issue of his *Journal* of November, 1873, speaks as fol-

lows, in regard to the American system of automatic fast telegraphy:

"Mr. George Little, who is well known for his indefatigable efforts and ingenuity in connection with automatic telegraphy, has applied the condenser to his instruments with marvellous results. He states that it enables him to transmit 5,000 words, or 30,000 signals per minute, over one wire, with perfect legibility, and that the Automatic Telegraph Company are now working the system between New York, Philadelphia, Baltimore, Washington and other cities.

This discovery promises to be of much importance in the business of electrical transmission. It will enable people to do their correspondence in full by telegraph, instead of by brief sentences, as at present. It will assist to prevent blunders in transmission, for which at present there is no remedy, except by double payment. It is well known that the Western Union Company will not otherwise guarantee the correct delivery of any messages sent over their lines. The successful introduction of the automatic system will, however, put an end to this extortion. The facility of transmission is so great that the Automatic Telegraph Company is now enabled to send twice as many words for the same money as the other lines; and thus the sender may make sure of a correct delivery of his message, without loss of time or payment of extra charges."

Finally, the operations of the Automatic Telegraph Company are carried on by virtue of a temporary license, provided the stipulations of an agreement on record be carried out; and for the use of my American system of fast automatic telegraphy—which is capable of recording thirty thousand flashes of the electric fluid by the product of thirty thousand separate decompositions in the chemically prepared paper, in "one minute of time."

7. In regard to indifference, I think our discoverer will find, if he takes the trouble, that one hundred thousand miles of ordinary line wire will equal in resistance over two millions of ohms. Since 1869 the quietest state of a galvanometer needle, as also that of a most delicate telegraph magnet, has frequently been shown during automatic transmission by my American automatic telegraph.

8. My time has been expended in order, if possible, to find out this fact.

9. See account (in "Electrician's Text-book, Noad," pp. 318, 19, 20,) of the experiments in this direction by one of our own distinguished scientists, Professor Henry. See also my own method employed for the automatic separation of, or the neutralizing of extra currents, which, in a dual form, takes possession of all conducting bodies when under the influence of electro motion. The operating of local or transferring circuits by the aid of different kinds of chemically prepared paper would be, figuratively speaking, like passing clouds, causing more or less insulation of the "glorious sunlight."

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GEORGE LITTLE, C. E.
Bloomfield Avenue, Passaic City, New Jersey, U. S. A.,
Consulting Electrician to the Automatic Telegraph Company, Inventor of and Patentee of the American Automatic Telegraph System.

August 23, 1874.

The Official Organ's Criticism of Bear's Duplex Criticised.

MITCHELL, IOWA, Aug. 25.

TO THE EDITOR OF THE TELEGRAPHER.

WHY don't the *Journal of the Telegraph* take up my combination duplex and dispose of it as summarily as it attempted to do with my first? For I think there is much better opportunity offered in my second method for criticising the same principle he thinks he disposes of in my common instrument plan. I don't thank you, Mr. TELEGRAPHER, if your reply to your part (the lion's share) of his criticism above referred to causes his late temerity in this respect, for I am only too glad to be taught anything relating to our profession. In his last issue he repeats nearly a quarter of a column of his first criticism, in which he tells me that somebody supposes Mr. Preece's problem to be solved by me by signaling with two batteries at the same terminal. Now, I have yet to learn that a battery will give signals without some interruption of its circuit, and that my battery connected to relay is ever thus disconnected by any of the keys. Also, "were the line open no current would pass through the relay, for the reason that any tendency in the battery connected to the relay to set up a current, is balanced by the opposing current from the battery connected with the resistance coil." Applying this admission to the battery connected to resistance coil tending to set up a current through relay, and I fail to see what difference it makes in this battery's effect on relay whether main line is open or closed. But his next assertion shows how he gets thus mixed up, viz., that I "send the whole current from the sending battery through both coils of the relay." Now, it may expose ignorance when I acknowledge that I always supposed the battery connected to the sending key was the "sending battery," and that the key which breaks the battery circuit is the sending key—being in my method armature "a" at B." You will excuse me, I trust, for taking so much of your space when I inform you that I DO NOT use a condenser, and never saw one. SIMÉON J. M. BEAR.

Miscellaneous.

MAGNETS.—M. Jamin describes experiments which support these three propositions: (1) The number of elementary magnetic threads and so the quantity of magnetism a magnet may contain, depend only on the middle section. (2) The (*épanouissement*) of the poles of these threads, or the distribution of intensities, is regulated by the form and extent of the exterior surfaces of the magnet. (3) If the surfaces diminish, the tension increases till they become insufficient to allow of the elementary poles opening out, and a portion of the two contrary magnetisms disappears, reproducing the neutral state.

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" " " 351.....2 "
" " " 352.....1 "
" X, " 391.....6 "

What Causes the Excitement?

AS OUR readers are aware, the contest between the inventors, or those who claim to be inventors of systems of fast telegraphy—under which term may be included the duplex, quadruplex and automatic systems—has recently been very acrimonious. The charges of infringement of patents, and improper appropriation of ideas, have been numerous, and we have no hesitation in saying that some of these charges (we will not now particularize them) were well founded.

It may have seemed strange to those who are distant from the telegraphic centres, and who have little knowledge of the inner workings of the interests which control telegraphic matters, that a contest so animated should thus suddenly spring up, when apparently there exists no special occasion to excite it. There are, however, underlying, these demonstrations, causes and motives which, when properly understood, will fully account for them. The interests involved are very important, and extend much farther and deeper than the individuals who claim to be the actual inventors themselves.

The recent excitement commenced with the attempt

which was made, through the city newspapers, to depress the price of the shares of the Western Union Telegraph Company for speculative purposes, by reports of a great combination to take up and carry out the construction of a general system of automatic telegraph lines throughout the country. This had the desired effect, and it was considered necessary to counteract it by a demonstration on the other side. For this purpose a telegraphic chicken, which had been for some time incubating, prematurely broke its shell, and was announced to an astonished community by a tremendous crowing on the part of its supposed progenitors. This was the wonderful quadruplex system, which in an instant "quadrupled the capacity of the 176,000 miles of line of the Western Union Telegraph Company." Wonderful and valuable, indeed, if true! But unfortunately this newly hatched telegraphic chicken was very soon demonstrated to be a fraud and no chicken at all, but a very old fowl, fully described in telegraphic annuals extending back twelve or fifteen years, and which had before proved of little value, and whose value had not been increased by age. The reputed inventor was the worst sufferer by this exposure, as his chicken had not been sold, as had been intended, before being fully hatched out, to the Western Union Telegraph Company. It was soon discovered that that particular rooster wouldn't fight, and it was speedily relegated to a back seat.

The Western Union officials however, had become awakened to the fact that automatic telegraphy had progressed somewhat, and was likely to prove, before long, a serious antagonist. Having, after decrying and denouncing the duplex inventions of Mr. STEARNS, ended by purchasing the patents and lauding the invention even more extravagantly than they had previously denounced it, there could be, of course, no valid objection to a similar recantation in regard to automatic telegraphy, which has been equally denounced and ridiculed; and the same distinguished appropriator of anybody and everybody's ideas and inventions, whose recent quadruplex abortion had cast him somewhat into the shade, sees a chance to recover his ground, and, in conjunction with the electrician of the company, is now engaged in an attempt to adapt some automatic combination for the purposes of the Western Union Company. As usual, he is working for the interests of both parties—with the Automatic Company against the Western Union—and with the Western Union against the Automatic. Under such circumstances he cannot be otherwise than happy, for he is in his element, and it is doubtless a matter of indifference to him which is ultimately fooled the worse.

All these things, however, have demonstrated the fact that there is likely to be a demand and remuneration for a successful fast telegraph system, and there is a very natural desire, on the part of the contestants, to realize fame, and so much of fortune as is possible under the circumstances. The distinctive automatic interests is also divided, and has not worked harmoniously for some time past, which has aggregated the contest and increased its bitterness. This is and has been a serious obstacle to the success and extension of automatic telegraph lines; but it is to be hoped that this will not long be the case, and that the advice tendered in the last number of THE TELEGRAPHER will be appreciated and followed. It will be understood by our readers, from what we have said, why our columns have been occupied so much, recently, in the discussion of these matters. It is undoubtedly true that there is soon to be a material change in the systems of telegraphy in general use in this country. The conditions necessary for this have been gradually but surely created, and the result cannot be much longer delayed. Realizing this fact, all who are interested in fast telegraph systems are seeking to put their houses in order, that they may be ready to receive the reward which is expected to be realized by the successful system, but of which, we fear, the share falling to the actual inventors will not, ultimately, prove very large.

How to make an open circuit work—close it.

Lightning Rods and the Protection of Buildings from Lightning.

AS THE heated term passes gradually away that industrious specimen of human nature, the ubiquitous lightning rod man, prepares himself for the fall campaign.

Everywhere, from Maine to Texas, on the prairies, in the mountains—no place is secure from his intrusion, no person from his good natured impudence.

The insurance solicitor has generally been deemed the king of importunates, but he isn't half a circumstance to the lightning rod man, who roams at will and attacks you, regardless of time or circumstance.

In view of the terrible destruction of life and property by lightning during the past summer, especially in the Middle and Western States, it might be well to examine the subject of protection from lightning, that we may be prepared, whenever the inevitable rod peddler does come, to judge of the excellence of his wares and criticise his method of erecting his protectors.

There are several requisites to a good rod:

First, it must have a large degree of conductivity; otherwise, even when well erected, it may fail, partially, in its work.

Second, it must go to water or it is worthless, and even worse. For a building without a rod is much more safe than one that has a rod, the bottom of which does not lead to damp earth.

Third, it should never be insulated from the building on which it is placed.

Now, let us see how nearly, in practice, these well ascertained and clearly defined laws are obeyed. The conductivity of a rod depends not only upon its size but also upon the metal of which it is composed. For instance, the conductivity of iron is only about one seventh that of pure copper. Therefore, an iron rod, to have the same conducting power, must be about seven times as large in diameter as a copper one.

Various forms of iron rods are sold, the lengths of which are screwed together. This is bad, because the iron rusts in the joints, and oxide of iron is a poor conductor. Iron rods should be welded or brazed together at the joints. Covering them with a coating of zinc (erroneously termed galvanizing) prevents corroding and rusting to a great extent, especially in the country, where coal is not burned.

Rods made of wires of iron and copper twisted together are faulty, because, the portion buried being damp, speedily begins a galvanic action, which soon results in the entire destruction of the iron, leaving no rod except a few thin copper wires.

The best form of rod, undoubtedly, is a copper strip, either nailed to the house, flat, or, if preferred, rolled into a tube and fastened by hooks to the wall.

In regard to carrying the rod to water. Dry earth is a non-conductor of electricity. Rods are generally put up in the fall, when the ground is thoroughly saturated, and the rogue who erects it digs down next the wall three or four feet only, and calls his job an excellent one. The victim forgets that the earth dries rapidly next the wall, and fancies that he is perfectly protected during the hot days of the following summer, when really the bottom of his rod is in earth or sand as dry as can possibly be; and it is only after his rod has received a charge that it cannot get rid of legitimately, and an explosion follows which injures, if it does not ruin his building, that he realizes the inadequacy of the protection.

Do not be afraid of putting the rod too deep. If a well is convenient dig a trench to it and carry your rod down to the bottom—or, at all events, so deep that it shall always be immersed to the depth of two feet. If the well is too far off dig down to permanent moisture, take a plate of old copper, solder your rod to the middle of it, and set the plate on edge in the hole. If laid flat, you will only have the bottom for an escaping surface, for the top, if not very deep, will become dry. Remember always, that the greater the conducting power of the rod, and the better the avenue for escape at the bottom, the more certain it becomes as a protector. In cities, where gas or water pipes, or

either, are in the building, connect your rod to the gas and water pipes, outside the meters, and this will furnish ample avenues of escape. The metal roofs, gutters, eave troughs and cornices should all be connected with your rods, as each piece becomes a rod of itself, and when charged, must discharge to something—into the building if there is no other outlet.

Do not allow the fellow to insulate the rod. It is dangerous in dry weather and useless in wet. Glass, when perfectly dry, is a very perfect insulator. Almost every one can recall an instance of houses being struck by lightning before a storm, when the building was dry—houses too, that had rods upon them and were supposed to be safe. How was it done?

A highly charged cloud, flying low, came drifting over the building; immediately the house became charged from the earth by induction. Suddenly another cloud, less highly charged, approaches the first, which discharges to its neighbor, and the tension of the two is made equal.

Instantly the charge which collected in the house top released, endeavors to return to earth with an energy proportional to its excess of tension over the earth below it. It has accumulated gradually, but it is discharged suddenly.

Now, if all metals on the building are attached to the rods, and the latter, with plenty of branches, is fastened direct to the house, the accumulation will pass to earth silently. If, however, the rod is insulated with dry glass, the current scatters, and in its endeavors to get to earth it commits, at times, fearful havoc.

It is strange that, although the danger of insulating rods has been known ever since rods were made, yet the brilliant gentlemen who perambulate the country erecting these danger traps are as profoundly ignorant and indifferent as if nothing had ever been known on the subject.

The inventor of lightning rods, Dr. FRANKLIN, would have scouted the idea of insulating them. It remained for an enterprising Englishman to "add to their safety" by insulators. Forthwith all the dealers caught the infection, and the frequency of shattered houses attest the result.

We advise all readers to examine any lightning rods on buildings they may have. If they do not comply with the above conditions change them or take them down. For, unless they do, the buildings they are upon are safer without them.

And when the talkative, impudent, ignorant lightning rod man comes again don't try to out talk him (that would be useless), but make him come to your specifications or go in search of other victims.

The Laying of the New Cables.—Reports of the Direct Cable being Sold to the Anglo-American Company.

If no accident or unexpected delay occurs, within a few days the new cable of the Anglo-American Telegraph Company will be successfully laid from Valentia to Newfoundland, the Great Eastern, which is engaged in the work, having at the latest accounts made excellent progress, notwithstanding she had encountered a severe gale. It appears that the proposed laying of this cable from this side to Ireland was abandoned, and it is being laid, as all the previous cables have been, commencing at the Irish coast. Although without definite information on the subject we presume the plan has been changed on account of the lateness of the season, making it hazardous to delay the work so long as would have been necessary to first make the voyage across the ocean. When this cable is complete the Anglo-American Company will have four cables in operation across the Atlantic. It has been decided to postpone the attempt to recover and repair the cable which has been broken for a long time until another season.

We presume that the Faraday is also engaged in laying the long section of the direct cable from Cahircivren, on the Irish coast, to connect with the end

buoyed off the coast of Newfoundland, although up to the time of writing no reports had been received of her progress. She was to leave London for the purpose on the 24th or 25th of August, the shore end of the cable having been already laid.

Unpleasant reports are in circulation that this cable has been sold out to the Anglo-American Company, but we have not been able to trace them to any reliable source. We had not originally very much faith in the enterprise as a competing cable, but it has been carried out as such up to the present time, and we had become convinced that we were mistaken in supposing it to have been, like the Great Western and some previous cable enterprises, initiated merely to sell out to the Anglo-American Company.

It has been stated recently by parties who profess to know, that an arrangement had been made to turn the cable over to the Anglo-American Company after its completion, but this story was brought to the attention of Mr. SIEMENS, who came over in the Faraday on her first trip, and he denounced it as a falsehood. The reports have revived, however, since, and are repeated in a communication from a London correspondent of the *New York Herald*, which appeared in that paper of last Sunday. We hope that they may prove to be unfounded, and that we shall see the experiment of ocean telegraph competition tried, now that the enterprise has proceeded so far.

Personals.

Mr. ROBERT MORTON, of the Cable room, at 145 Broadway, New York, has been transferred to the Western Union, Milwaukee, Wis., office.

Mr. H. L. GRAMZOW, of the night force, at 145 Broadway, New York, succeeds Mr. ROBERT MORTON in the Cable room.

Mr. CHARLES J. BROWN, manager of the Western Union office, at 125 Federal street, Boston, Mass., contributes a touching poem to the current number of *Hearth and Home*. Mr. BROWN will be remembered as the author of "Thomas Tot" and other telegraphic sketches, metrical and otherwise, appearing in this and other journals, over the signature of "Beta."

Mr. C. H. JENNINGS, formerly of the "B" Western Union office, New York, has resigned and accepted a position in the Signal Department of the United States Army, at Washington, D. C.

Mr. E. C. BOILEAU, of 145 Broadway, New York, has returned from a brief trip into the wilds of New Jersey, bringing home a complexion as ruddy as a berry. He was accompanied by Mr. BEN. LLOYD, of Pittsburgh, Pa., one of the most expert, most reputable and best known telegraphers of the times.

Any one knowing the present address of Mr. GEORGE WEBSTER, recently employed at No. 198 Broadway, New York, will confer a favor by communicating the same to Mr. CHARLES H. MIXER, at No. 145 Broadway.

Mr. J. D. WHITE, for the past three months report operator for the Western Union Telegraph Company at Jackson, Mich., has been transferred to the same position at Grand Rapids, Mich., office of the same company.

The Telegraph.

By Cable.

THE NEW ANGLO-AMERICAN CABLE.

LONDON, August 31.—The Great Eastern, up to yesterday (Sunday) noon, had paid out 647 nautical miles of the Anglo-American Company's cable, and all was going on well.

LONDON, September 1.—At noon yesterday the Great Eastern had paid out 722 nautical miles of the Anglo-American Company's new cable, and all was going on well, although a hard northeast gale had been blowing for thirty-six hours.

FACILITIES FOR DIRECT UNITED STATES CABLE.

LONDON, Sept. 2.—The Government telegraph authorities have agreed to lease a wire to the United States Direct Cable Company for transmission of its business to the cable terminus, with the privilege of operating it by the company's employés.

Quarterly Dividend of the W. U. Telegraph Co.

At a meeting of the directors of the Western Union Telegraph Company, held at the executive office of the company on Wednesday, Sept. 2d, a dividend of two per cent. was declared, payable Oct. 15th, for the quarter ending Sept. 30th.

Foreign Telegraphic Notes.

THE Eastern Telegraph Company's traffic receipts for the month of July, 1874, amounted to £27,247, and to £28,975 in the corresponding month of 1873.

The traffic receipts of the Eastern Extension, Australasia and China Telegraph Company (Limited) for the month of July, 1874, amounted to £19,641, and for the corresponding period of 1873, to £18,190.

The traffic returns of the Great Northern Telegraph Company for the month of July were—this year, 410,501 francs; last year, 271,873 francs. Total traffic receipts, 1st January to 31st July—this year, 2,499,909 francs; last year, 1,722,112 francs.

Mr. R. T. Brown, manager of the West India and Panama Telegraph Company's cables, arrived at St. Thomas from Para, where he left the Brazilian Cable Expedition. He has proceeded to Jamaica, but will return to meet the cable steamer Hooper with the cable to connect Cayenne with Demerara.

The British ship Challenger has finished sounding for the telegraph cable between Sydney and Wellington, New Zealand.

The king of the Sandwich Islands, in proroguing the Assembly on the 8th ult., congratulated the members on the introduction of bills to aid the construction of telegraph lines.

A "telegraph capital account," made up at the Post-office in May last, states the expenditure on the telegraphs of the United Kingdom to that date at £9,028,845; namely, £6,764,409 for undertakings, £2,132,595 extensions, etc., and £131,741 for pensions and commutations.

A dividend for the six months ending January 30th, 1874, at the rate of 15½ per cent., less income tax, has been declared by the Submarine Telegraph Company.

New Telegraph Line in Japan.

THE telegraph line between Foo Chow and Pagoda anchorage is opened and in full working order. The line is about eight miles in length. It runs for more than two miles on the right bank of the river. The entire line was constructed in twelve days at an expense of about \$4,000. It is worked on the Morse system, and is capable of transmitting fifteen words per minute with an experienced operator at each end. The mandarins of the province have examined the working of the line and are highly pleased.

There has been talk of the Mikado formally and ceremoniously opening the telegraph system, which, although now in operation for some years, has not yet been so honored. It was spoken of as his Majesty's wish that some such opening should take place a long time ago, but constant interruption on the main line between Yokohama and Nagasaki has interfered with it hitherto.

A Practicable Route Discovered for the Pacific Telegraph Cable.

THE following despatch has been received at the Navy Department, at Washington, from Comandor Belknap, of the United States steamer Tuscarora, who has for some time past been engaged in making soundings in the Pacific Ocean, to ascertain the practicability of laying a submarine telegraph cable between China, Japan and the Pacific coast of the United States:

"U. S. Steamer TUSCARORA, }
OUNALASKA, July 29. }

Hon. Geo. M. Robeson, Washington.
I arrived here to-day. A shore line is practicable. The greatest depth found is 4,037 fathoms, eighty miles from Aggalton; the next greatest depth, 3,754 fathoms, 120 miles east of Kuriles Straits. There is a ridge between Karilo and Aleutian Islands, the least water on which is 1,777 fathoms. There is a fine harbor and beach at Todega.

(Signed), GEO. E. BELKNAP,
Commander."

Arrival of the U. S. Steamer Tuscarora.

THE United States Steamer Tuscarora, sent out to make soundings for a cable from the Pacific coast to Japan and China, arrived at San Francisco on Wednesday last. She left that port just a year ago on that date to survey the line and make the soundings for the cable. The first attempt from Cape Flattery was abandoned, on account of the lateness of the season,

and she made soundings on and off the coast from Cape Flattery to San Diego. From that port she struck out from Honolulu, making soundings as she went. From Honolulu she proceeded to Yokohama via Boum Island. The deepest water found on this line was 3,287 fathoms. Two lines were started from the coast of Japan, but abandoned on account of the great depth of the water. The third line was found feasible, and a line was run to Roorile Island, one of the Aleutian group, thence run to Ounalaska, and from there to Cape Flattery. The greatest depth found on this line was five and one fourth miles.

Telegraphing from Stenographic Notes.

THE most important speeches and proceedings of the Democratic State Convention of Missouri, held at Jefferson City, Missouri, on the 26th and 27th of August, amounting in all to about 15,000 words, were reported *verbatim* by Mr. Charles E. Weller, formerly chief operator at Milwaukee, Wis. He was a short hand reporter of St. Louis, and telegraphed by him to a St. Louis daily paper from his original stenographic characters at the ordinary rate of speed.

This is believed to be the only instance of this feat being successfully performed.

What Does This Mean?

ONE great desideratum which the "Direct United States Cable Company" is expected to supply, namely, cheap telegraphy, is said to be in jeopardy. There is an ugly rumor of an amalgamation with other cable companies, a process which was expressly guarded against in the articles of association. Shareholders and the general public are alike interested in seeing that these articles are not infringed in the slightest degree, for if any concession is made the "amalgamated" companies will continue the monopoly and we shall be at their mercy, as we so long have been. The Newfoundland Colonial Legislature is also said to be playing into the hands of the Anglo-American Cable Company, and everything is being done by which the use of the direct cable is likely to be cramped and fettered. Petty opposition of this kind, though much to be deplored, was to be expected, and can only be defeated by energy on the part of the directors of the new company, backed by the good will of the public. —London Correspondence of the *New York Herald*.

SHOULD telegraph operators be considered dishonest because they "hook" all their messages?

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

AUG.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
27	76 1/4 76 3/4	.....	.....
28	76 3/4 77	.....	.....
29	76 1/4 76 3/4	.....	.....
31	76 1/4 76 3/4	.....	.....
SEPT.			
1	76 3/4 77 3/4	.....	.....
2	77 3/4 78 1/2	.....	.....

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended Aug. 4, 1874, and bearing that date.

153,700—ELECTRO-MAGNETIC ENGINES. — L. Bastet, New York, N. Y. Filed Aug. 24, 1874.

Armatures borne on radial spokes, each armature and spoke forming a T shaped piece. Armatures have no connection with each other, except through a common hub.

In an electro-magnetic motor the combination with the rotary shaft G or hub S, of the series of T shaped armatures B C, consisting of radial arms B and axially or laterally extending cross heads C, the said T shaped armatures being magnetically isolated from each other, and having no connection of any kind one with another, except through their common hub S on the shaft G, substantially as herein specified.

153,800—ELECTRO-PNEUMATIC RAILWAY SIGNAL APPARATUS.— Alexander Bernstein, Berlin, Prussia. Filed March 17, 1873.

Electric circuit closer at station, operated by a pneumatic apparatus, part of which is at some distance therefrom, and which is operated by a passing train.

1. In a railway signal apparatus, the combination with the pneumatic apparatus, consisting essentially of the air bulbs j and k and connecting tube i, and operated by a passing train, of an electrical circuit closer operated thereby, substantially as and for the purpose described.

2. The combination of the slide rails B with the cross piece D, and the bow spring e with its hanger f and adjustable plate g,

as a means of operating the pneumatic apparatus, essentially as described.

3. In combination with the rails B, cross piece D, and spring e, the pieces l, arranged to prevent a side movement of the cross piece, essentially as described.

4. In a railway signal apparatus the combination of two slide rails B, to be acted on by the wheels of a car, and a connecting bridge piece, D, centrally pivoted, substantially as and for the purpose described.

5. In combination with the pneumatic apparatus, the depressing devices and spring e, the adjustable plate g to regulate the degree of pressure on the bag h and the power required to operate the pin m, and thus connect the circuit, essentially as described.

6. The combination of the rails B, cross piece D, pin c, bow spring e, hanger f, adjustable plate g, rubber bag h, metal tube i, rubber bag j, plate l, pin m, spring o, and platinum plate p on the metal strip q, and the wires r of an electric alarm signal, all arranged and operating essentially as described.

153,841—CELLS FOR GALVANIC BATTERIES. — A. L. Nolf, New York, N. Y. Filed March 13, 1874.

Outer cell made of carbon, forming one element in the battery.

As a new article of manufacture, an outer cell of carbon for galvanic batteries, rendered impervious to moisture upon its exterior, and provided at its base with a cushion, all constructed substantially as described, for the purpose specified.

For the week ended August 11, 1874, and bearing that date.

153,035—RAILWAY SIGNALS OPERATED BY ELECTRICITY.—Arthur H. Dailey, Dwight, Ill. Filed April 11, 1874.

Signal placed at any desired point; a current is sent through the magnet's, releasing detent, and allowing arm to fall across track; arm acts as detent to a spring hammer, whose stroke, on being freed, fires a torpedo; arm swung around by a passing train, allowing hammer to strike a torpedo.

1. The combination of the hammer B, actuated by a weight, D', the swinging pole G, latch or detent F, spring trip H h i, and the electro-magnet, the armature of which is attached to and operates to disengage the said spring trip, substantially as specified.

2. The combination of the hammer B, the wheel C, weight D', the detent arm F, shaft F', arm F", and pole G, substantially as specified.

3. The combination of the pole G, detent contrivance, and the shaft H, provided with hook h and arm J, and the hook i upon the pole G, substantially as specified.

4. The noted yoke I, in combination with the swinging pole G, substantially as specified.

5. The combination, with the arm J, of the magnet M, the cog wheels m p, swinging frame m', armature n, pawl l, and weight r', substantially as specified.

Died.

ANDREWS.—At Chicago, Ill., July 24, 1874, the only child of Mr. CHET. A. ANDREWS, operator, Chicago, Ill., Western Union day force, aged one and a half years.

ARMSTRONG.—At Chicago, Ill., August 15, 1874, the infant son and only child of Mr. E. L. ARMSTRONG, operator, Chicago, Ill., Western Union day force.

MAYNARD.—At Chicago, Ill., August 15, the infant daughter of Mr. H. C. MAYNARD, night manager of the Western Union, Chicago, Ill., office.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

—:—

COMPARISON OF RATES.

New York to TRENTON, 20 words 25c.	By Automatic. 20 words 25c.	New York to PHILADELPHIA, 20 " 25c.	By Wes'n Union. 20 words 45c.
BALTIMORE, 20 " 25c.		BALTIMORE, 20 " 25c.	50c.
WASHINGTON, 20 " 25c.		WASHINGTON, 20 " 25c.	70c.

Each additional word 1c. Each add. word, 2 to 3 cents. UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

GLASS VISITING CARDS.

RED, BLUE, WHITE.

CLEAR AND TRANSPARENT.

Your name beautifully printed in Gold on One Dozen for 50c.; post paid, three dozen, \$1.

Must have Agents everywhere.

Outfits, 25c.; Samples, 3c.

F. K. SMITH,

BANGOR, MAINE.

IMMENSE REDUCTION OF PRICES.

New York, May 30, 1874.

We are offering our Telegraph Instruments at 20 per cent, discount from our list, or from the present published price list of any other manufacturers of first class Telegraph Instruments. Quality will be strictly maintained.

L. G. TILLOTSON,
8 DEY STREET, N. Y.

ANDERS' MAGNETO PRINTING TELEGRAPH INSTRUMENTS.

These instruments require

NO ACIDS OR CHEMICAL BATTERY,

the currents required to operate them being generated from PERMANENT MAGNETS.

They print very rapidly, and having been fully tested on private lines during the last eighteen months, have proved to be

VERY RELIABLE.

The following parties, among others, have purchased them after giving them

THOROUGH TRIALS

on their several lines:

- THE BOYNTON PACKING COMPANY, Boston, Mass.
- CHAS. HULBERT, Esq., 8 Exchange Place, Boston, Mass.
- THE BOSTON AND ALBANY RAILROAD CO., Boston, Mass.
- Messrs. J. H. CHADWICK & CO., Boston, Mass.
- JAMES ALEXANDER, Esq., Agent Cunard Steamship Company, Boston, Mass.
- CHAS. S. LOVERING, Esq., Treasurer of Whittenton Mills, Taunton, Mass.
- HON. ISAAC BRADFORD, Mayor of Cambridge, Mass.
- GEO. H. COPELAND, Esq., Chief of Police for the Cambridge Police Telegraph, Cambridge, Mass.

We also continue to manufacture.

ANDERS' MAGNETO DIAL TELEGRAPH INSTRUMENTS,

which have been extensively used for several years, and are recommended as the

BEST DIAL INSTRUMENTS MADE.

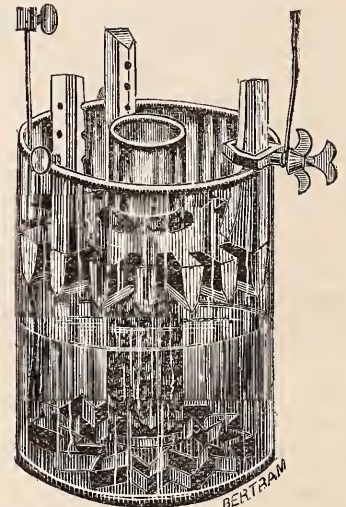
Parties who purchase either our PRINTING OR DIAL INSTRUMENTS can exchange one for the other at any time, as both the Printers and Dials are used with the same transmitters.

WELCH & ANDERS,

30 HANOVER STREET,

Boston, Mass.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

MESSAGE HOOK. \$5 PER 100.

For sale generally by

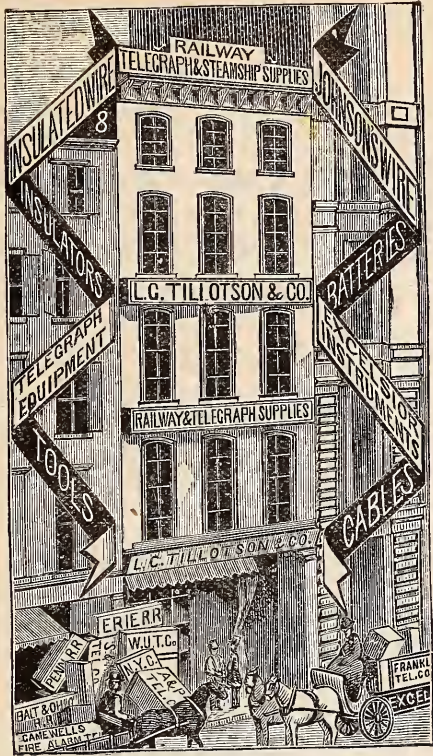
Dealers in Telegraph Goods. 75c. PER DOZ.



W. T. WESTBROOK,

WILMINGTON,

DELAWARE.



BUY THE BEST.

IF YOU WANT
EQUIPMENT
FOR A
TELEGRAPH LINE,
ORDER OF
L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
and **QUALITY THE BEST.**

THEY GUARANTEE
EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE
CONSTRUCTION AND OPERATION OF LINES
ALWAYS ON HAND.
THEIR
EXCELSIOR
TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
success of the times.

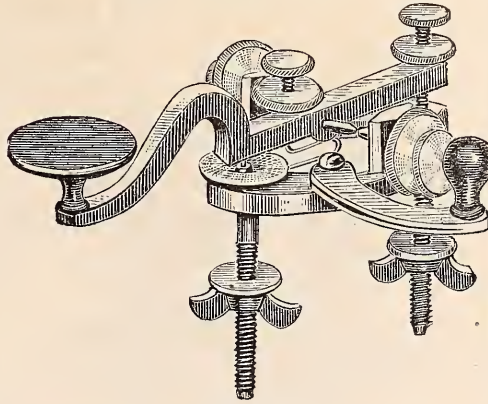
L. G. TILLOTSON & CO.,
8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all
instruments of our manufacture.

L. G. TILLOTSON & CO.,
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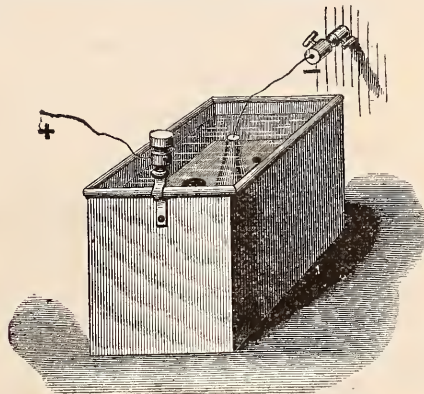
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit
or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine
our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR CLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information
for Superintendents and others interested in the Science of
Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for
manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic
and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the
battery. Sulphate of copper is the only chemical required to be
used.

These Batteries have been fully tested during the last year,
although only recently offered for sale, and have proved to be
superior to any other as regards efficiency, economy and dura-
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four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for
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On Locals, one No. 1 cell is used in place of two Daniells, at a
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No. 2 is a round cell, designed for main line. Price, \$2.
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TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood
Bases.

RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and **CURVED LEVER KEYS,** warranted not to
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REGISTER SPRING and **WEIGHT,** of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty;
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IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and **KEY** on same base, making an ele-
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WILSON, HASKIN, WESTERN UNION and **PLUG CUT-OUTS.**
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARREST-
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ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

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VAUGHAN'S AUGURS and **TOOLS** in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID
the finest in the Market.

TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER,
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SECOND HAND RELAYS, CUT-OUTS and **REGISTERS** very
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AGENTS FOR

Repairing and Model Work promptly attended to.
Bliss' Manual and Price List furnished free on
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A MERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF
FIRE ALARM & POLICE TELEGRAPH
WITH A CENTRAL OFFICE,
OR
UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

**SUPERIORITY, VALUE
AND
UNIFORM RELIABILITY.**

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| Alleghany, Pa., | New Orleans, La., |
| Boston, Mass., | New Bedford, Mass., |
| Bridgeport, Conn., | New Haven, Conn., |
| Buffalo, N. Y., | Newark, N. J., |
| Baltimore, Md., | Omaha, Neb., |
| Chicago, Ill., | Philadelphia, Pa., |
| Cincinnati, Ohio, | Pittsburg, Pa., |
| Columbus, Ohio, | Portland, Maine, |
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| Charlestown, Mass., | Providence, R. I., |
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF
**FIRE ALARM TELEGRAPH
IN THE WORLD.**

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of.

**FIRE ALARM
AND
POLICE TELEGRAPHS,**

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unfellability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the original **FARMER & CHANNING PATENTS**, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

**EFFICIENCY,
RELIABILITY and
ECONOMY**

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,
104 Centre Street,
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TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

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KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

MERCHANTS' MANUFACTURING AND CONSTRUCTION CO.

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COPPER FOR CONDUCTIVITY.

STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

Relative TENSILE STRENGTH, homogeneity and elasticity—decreasing the liability to breakage from cold weather, sleet, etc.

CONDUCTIVITY—insuring great improvement in the working of lines in any condition of the weather.

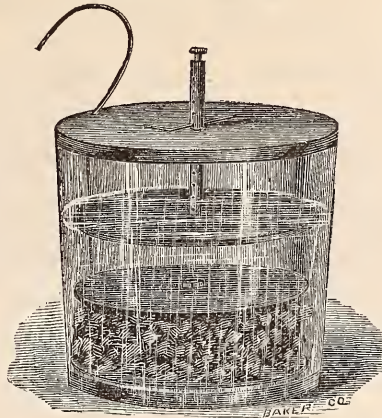
And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.

Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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Address—
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ALANSON OARY, Treasurer,
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BLISS RESERVOIR BATTERY.
 PATENT APPLIED FOR.



Price per Cell, \$2.00.

This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

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 MANUFACTURERS AND DEALERS IN
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 NEW AND SUPERIOR PATTERNS OF
STANDARD TELEGRAPH INSTRUMENTS.

These Instruments are elegantly designed, thoroughly well finished, and scientifically adapted to the service required.

- RELAYS,**
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In addition to these we furnish ALL DESCRIPTIONS OF TELEGRAPH MATERIAL AND SUPPLIES, such as

BATTERIES, INSULATED WIRES, CHEMICALS
 of all kinds, etc., etc.

THE NONPAREIL TELEGRAPH INSTRUMENT,

For Amateurs and Learners, and Short Lines.

GLOBE LIGHTNING ARRESTERS.

Bradley's Apparatus for Electrical Measurement.

We are the Agents for the sale of this new and very superior Instrument for Electrical Measurement.

BRADLEY'S BOX RELAYS AND SOUNDERS.

BRADLEY'S NAKED WIRE HELICES AND MAGNET SPOOLS,

of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

Also, Agents for

HOCHHAUSEN'S SUPERIOR LOW PRICED TELEGRAPH INSTRUMENTS.

Sole Agents for this

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

Send for New Catalogue and Price List.

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LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of

THE TELEGRAPHIC MANUAL,

by Mr. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

THE
TELEGRAPH MONITOR:

A REVISED AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

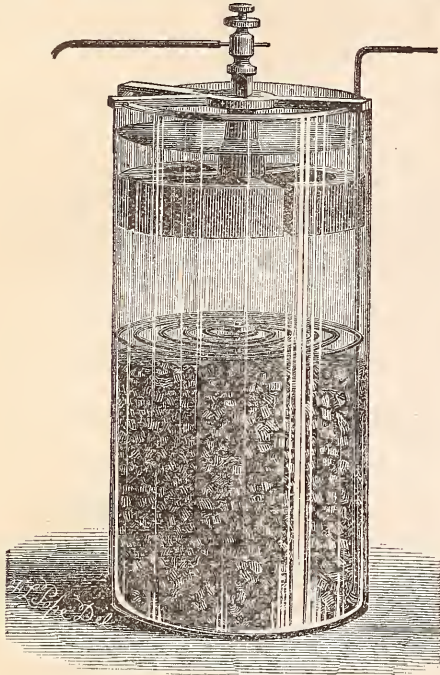
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given. The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE

CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is ABSOLUTELY UNIFORM at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

L. G. TILLOTSON & CO.

8 DEY STREET, NEW YORK,

SOLE AGENTS.

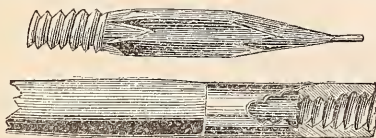
NEW YORK, Oct., 1873.

We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

LOCKWOOD BATTERY CO.

W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

Agents for towns, and counties wanted.

GEO. H. BLISS & CO., Gen'l Agents,
41 Third ave., Chicago, Ill.

ANSON STAGER, Pres't. ELISHA GRAY, Sup't. ENOS M. BARTON, Sec'y.

WESTERN ELECTRIC MANUFACTURING COMPANY.

No. 220 KINZIE STREET, CHICAGO.

TELEGRAPH, WIRES, INSTRUMENTS,
BATTERIES, TOOLS,
INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

SEND FOR CIRCULAR.

HAMBLETT'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND
UNION BRAND EXTRA QUALITY.

JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

PAINTED CROSS-ARMS.

KENOSHA CROSS-ARMS.

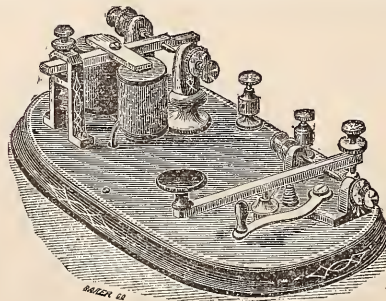
OFFICE WIRE, many varieties.

COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

Western Electric M'f'g Co., Chicago.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
Chicago, Ill.
PRIVATE LINE INSTRUMENTS.



Price, \$10.00.

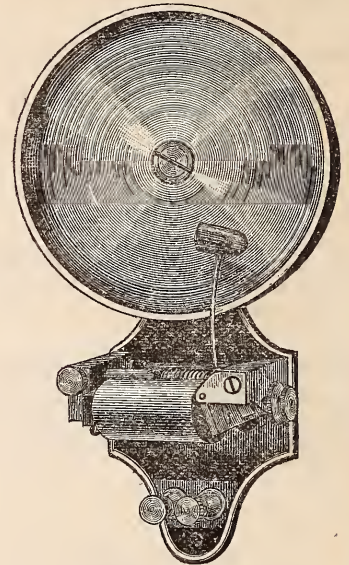
This Instrument is well finished, and gives a clear, loud sound. It is made to work on a line from a few feet to ten miles in length. Give length of line in ordering Instrument. One cup of BLISS RESERVOIR BATTERY is furnished with each Instrument.

GEO. H. BLISS & CO.,
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W. HOCHHAUSEN,
Manufacturer of
ELECTRICAL INSTRUMENTS,

132 WILLIAM STREET (rear),

Between Fulton and John Streets, NEW YORK.



One half of actual size

ELECTRIC BELL,
PATENT SELF-CLOSING KEY,

(Patented October 27, 1873.)

Price.....\$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard. Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight. \$50 00

Sounders, from..... 4 50 to \$6 50

Electric Bells, single stroke or continuous ringing, from..... 5 00 to 8 00

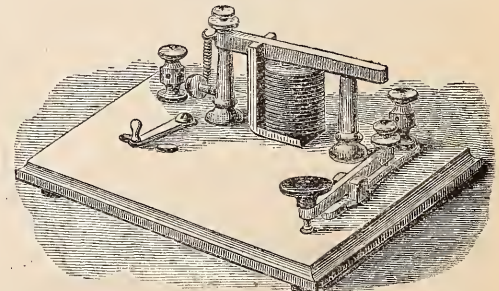
Relays, from..... 9 50 to 16 00

Improved Switch Keys, from..... 3 00 to 5 50

Send for Illustrated Circulars. The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

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The Telegrapher

A Journal of Electrical Progress.

Vol. X.

New York, Saturday, September 12, 1874.

Whole No. 426

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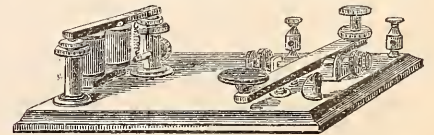
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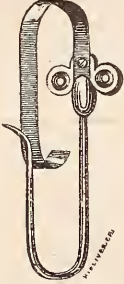
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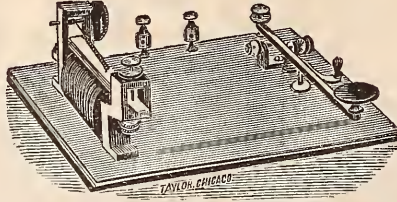
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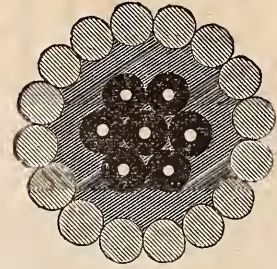
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, SEPTEMBER 12, 1874.

VOL. X.

WHOLE No. 426.

Original Articles.

Old and New American Telegraph Systems.

By OLD TELEGRAPHER.

WHEN the writer first engaged in telegraphic service, and for several years subsequently, there were but three systems of electric telegraph in use in this country—these were the Morse, which had been quite generally introduced and tolerably familiar to the public; the electro-chemical system of Prof. Bain, known as the Bain system, which at one time promised to become a popular and general telegraph system, and the printing telegraph invention of Prof. Royal E. House; the latter by all odds the most ingenious, and which, in some respects, possessed decided advantages over both of its competitors, and was believed to be destined eventually to supersede the others very generally in practical use. The causes which led to the triumph of the Morse system over its competitors are too well known to the old time telegraphers, or those who can date back fifteen to eighteen years, and, perhaps, would not be of sufficient interest to the later generation, who only know Morse—and, it is to be feared, many of them the Morse but indifferently—to warrant occupying time and space in repeating the story.

There was one element which entered into the contest, however, of which there was not sufficient account taken at the time, but which was a very important one, and would of itself have ultimately decided the question, and that was the inferior insulation and conductivity of the lines. With the Bain and House systems no local circuit could be used, even if they could be adapted to them, for the reason that the local circuit was patented and in the hands of the Morse party. This, as it will at once be understood, gave the Morse a decided advantage in working over the inferior lines which, in those days, were considered good enough for telegraphic purposes. The House instrument, especially, in order to be worked in circuits of even 200 to 300 miles, required that the lines should be in pretty good condition, which then was seldom the case. The true principles of insulation and conductivity had yet to become generally learned through much trouble, tribulation and cost, and even at the present day are not so generally recognized and understood as they might be to advantage. By means of the local circuit and sounders or registers operated by the local battery, the Morse lines, with operators of fair ability, could operate what were then considered long circuits much more advantageously than either the House or the Bain, and by means of repeaters their circuits could be indefinitely extended—and no repeater was ever invented that would repeat successfully and reliably the rapid breaking and closing of the House circuit wheel.

The actual condition of some of the lines constructed and used in the early telegraphic days have been already described in former contributions by the writer, and that their defects have not been exaggerated any old time telegrapher will bear witness. How the House instruments could have been worked at all upon some of them, was more wonderful than that they should not have shown better results. One reason why they were worked as well and reliably as they were, arose undoubtedly, to a great degree, from the fact that the House telegraph operators were more thoroughly educated in the business, and that with scarcely an exception they were enthusiastic in their affection for the instrument and system—notwithstanding the days and nights of toil, tribulation and trouble experienced—and firmly believed it to be, in almost every respect, superior to any telegraph system that ever had been or could be invented. We of the House persuasion looked down with kindly, compassionate feelings upon those who were so unfortunate as to occupy a lower place in the profession as "Woodpeckers" and "Dye-tub" operators. Each and all were firmly convinced that within a few years the printing telegraph was destined to be "the telegraph system" of the country, and that Morse and Bain would occupy only subordinate places in the telegraphic temple. This may, and no doubt does seem very absurd now, but it was the universal feeling and belief among the House telegraph operators, and it was, therefore a labor of love as much or more than of

labor with us to make the system a success. "Prompt, accurate and reliable" was the motto of the House telegraph companies, and for accuracy the House printing telegraph has never been exceeded. As for the promptness and reliability none of the earlier telegraph lines could boast very much.

If we had in those days had wires as well insulated or with conductivity equal to that of some of the main wires of the Western Union Company now, we could have exceeded the record, which was by no means one to be ashamed of, of the old House lines. No instrument has ever yet been made that could quite equal it for speed, when everything was in good condition—of course I do not include in this the automatic transmission, which is an entirely different affair. It furthermore had the advantage that, once the message was over the line, it was complete, and needed no re-writing or copying, with multiplying chance for error. Most of these advantages are preserved in the combination instrument used in a very few offices by the Western Union Company, which has also advantages of its own which should entitle it to more general use on the lines of the company.

The Bain system possessed but few, if any, advantages over the Morse, and labored under some disadvantages which could not but result in its final abandonment as a distinct system. It was introduced mainly for the purpose of competition with the Morse, which had begun to obtain a foothold, and was likely to prove valuable and remunerative to the introducers, and naturally became absorbed into the Morse combination much sooner than the House. There was not, so far as could be discovered, that enthusiasm for the Bain system on the part of the Bain operators that there was for the House system on that of the House operators, and there was apparently but little regret when it ceased to exist as a practical system. In these later days the chemical telegraph system has been revived in the automatic telegraph systems, and in these it is likely to render good service yet, as there appears to be no other method by which a fast automatic telegraph system can be worked.

The printing telegraph instrument of Prof. Hughes, for some reason, did not give as satisfactory results on American lines as was anticipated, but has since been extensively adopted in Europe. It was a most ingenious instrument and deserved to succeed, and it is a satisfaction to know that in other countries the Professor has reaped fame and fortune from his invention. The Hughes instrument had a duplex attachment, and was, so far as known, the first and only duplex printing telegraph ever operated. The writer assisted in working the Hughes duplex printer on the line between New York and Boston, and it worked successfully, though never very constantly or reliably. For the failure to realize Prof. Hughes's expectations, undoubtedly the bad condition of the line, its defective insulation and large percentage of escape was, largely chargeable. It is believed that after he left this country Prof. Hughes practically abandoned the duplex feature of his invention, as nothing is said of its use on European lines. It was a very ingenious idea, however, and very well worked out, and under more favorable conditions and circumstances might have proved of value and importance. The Hughes, as well as the House printer, were absorbed in the "Combination Printer" of Mr. Geo. M. Phelps, then of Troy, N. Y., but now and for many years past Superintendent of the Western Union shops in this city.

It was not intended when this article was commenced to go into so extended a dissertation upon telegraph systems of the olden time, but it is one of the peculiarities of advancing years that we become garrulous over the recollections and remembrances of the days long since passed away. Since the time of which I am now writing a new telegraphic generation has come upon the stage, to whom House, Hughes and Bain, if known at all, are but traditions, and, doubtless, many even of those who may, perhaps, be regarded as in their second telegraphic childhood, will be surprised to learn that a duplex telegraphic printer was actually worked between New York and Boston sixteen or seventeen years ago.

Many printing telegraph instruments have been invented since the time of which I have been writing, but none which have succeeded in obtaining any standing for general commercial telegraphy. For reporting telegraphs, private and short lines, they have been and are extensively used, but none has been brought out as yet whose superiority for commercial telegraphy has been so satisfactorily demonstrated as to lead to its adoption. This class of instruments seems to have been fully developed at first in the House, Hughes and Combination, and, except for specialties, has had its day. To work either of the instruments mentioned to the best advantage three things were indispensable—a good line, an instrument in good order, and last, but by no means least, a good and competent operator. "Plugs" are of little use on printing telegraph instruments, and if after due course of trial the operator failed to be developed, but one thing remained for the

student or apprentice, which was to "step down and out" into some more congenial employment.

The inevitable tendency of the present time is to seek to develop faster systems of telegraphy. The business has increased so enormously, and the demand for telegraphic facilities is increasing so constantly and rapidly, that it is becoming essential that the capacity of lines and instruments should be increased rather than that these should be indefinitely multiplied. The duplex systems of Farmer, Stearns and others are important advances in this direction. Other duplex systems have been and are being perfected, and will be introduced, by means of which the capacity of a wire is very largely increased. The number of duplex inventions which have already been brought out is quite large, and others still are incubating to be brought forth in due time. Many, perhaps it may be said most of them, will in practice prove failures, but then it has already been demonstrated that no one company can hold a monopoly of duplex telegraphy.

So much has already been said in regard to the automatic telegraph system in THE TELEGRAPHER that it may hardly be considered necessary to say much about it at this time. It is, however, the great fact in telegraphy at the present time, and undoubtedly is to exercise a most important influence in the future. Its progress has been slow heretofore, it is true, but it will, under some management and control, eventually be generally introduced in telegraph lines throughout the country. It will not do for any leading telegraph organization to ignore automatic telegraphy, for the times and the interests of telegraph companies, employes and the public demand it, and that it will be forthcoming and successful there is not the slightest doubt. My friend Craig's celebrated "ten year old child" will not be far advanced in its teens when automatic telegraphy will have taken its proper place among the telegraphic systems in general use.

New Printing Telegraph Line.

SOME twenty years ago there was nothing that so much and so regularly excited the editors of leading newspapers and telegraphic news agents as the weekly hudget of European news, which was brought to Halifax, N. S., by the Cunard steamers, and to this city by the Collins steamers. The New York Associated Press, under the lead of its practical founder and late general manager, D. H. Craig, Esq., had long held a monopoly of the news at Halifax, but the news by the direct steamers, at New York, was often obtained by the opposition news agents ahead of the Associated Press. This difficulty Mr. Craig determined to overcome by the aid of carrier pigeons and electricity; and to this end the underwriters and shipping merchants of New York were prevailed upon to furnish the necessary capital to build the first, and, at present, the only telegraph line between this city and Sandy Hook. Simultaneously there was erected at the point of the Hook a building which answered the double purpose of a telegraph office and carrier pigeon "home," which was stocked with some of the celebrated birds which had done service for Mr. Craig and the *New York Herald* between Halifax and Boston years before the telegraph was extended east of Boston.

The agent of the Associated Press at Liverpool was then instructed by Mr. Craig to prepare a complete digest of the leading features of the week's commercial and general news, which was given to the pursers of the steamers with orders to throw the same overboard wherever the Associated Press's news boat should be seen, and as soon as the steamers were signaled from the Highlands the agent of the Press, with a carrier pigeon in a basket, would put off from the point of the Hook, and sailing out in the track of the approaching steamer, would obtain the news and quickly transfer it to his winged companion, and in a few seconds or moments, and generally before the steamer had passed the Hook, the carrier had delivered its precious freight into the hands of expectant operators at the telegraph office, who quickly telegraphed the news to Mr. Craig, at the office of the Associated Press in this city, and through him it generally reached the editor of every daily journal in the country long before the steamers reached the inner harbor of this city.

Up to this time the old semaphore telegraph, stationed on top of the present Custom House, and the rival telegraph news agents had managed to sustain themselves, in opposition to the monopolizing tendencies of Mr. Craig's management of the Associated Press—but here was a dilemma for which they were not prepared, and to extricate themselves was wholly out of their power, and our old time friend Leggett's antiquated semaphore telegraph, and the whole opposition telegraph news agency business tumbled into something worse than printer's devil's "pi;" and thereafter, so long as Mr. Craig continued in the management of the Associated Press—some fifteen or eighteen years—that institution was probably one of the most absolute despotisms in business which ever existed on the face of the earth; and yet the press of the country

seemed to thrive under it as they never throve before; for the reason, probably, that the despot who reigned over them knew much better than their editors did what they really needed.

It will be seen, therefore, that the first telegraph line to Sandy Hook, twenty years ago, played no insignificant role in stamping out, for fifteen or eighteen years consecutively, every vestige of effective opposition to the rule of the New York Associated Press.

And now, under very altered circumstances, it appears that some of the originators of the first line to Sandy Hook—the underwriters, shipping merchants, etc., etc., under the lead of the Merchants' Exchange News and Maritime Associations, of Beaver and Pearl streets, in this city, are about to build a new line to the upper and lower Quarantine, to the Highlands of Neversink, Sandy Hook and Long Branch, etc., and there is a certain something about the beginning and the management of this enterprise, up to this time, which looks as though these new comers into the telegraph field had come to stay; and they show, in their first manifestations of life, that they are directed by people who have level heads and who are not novices in telegraphy or in news and news appliances.

The line is being engineered by W. H. Heiss, Esq., late General Superintendent of the W. I. Cable Company, and one of our most competent and faithful old time telegraph constructors and managers. Mr. Heiss has received *carte blanche* from the gentlemen he serves, and he is expected to give the news room and its supporters a model telegraph line, and it promises to be the line of the country.

The poles are of extra size and best chestnut timber, neeled and set not less than four feet into the ground. The wire is of a special size, and is being made by the American Compound Telegraph Wire Company, of Twenty-ninth street, from best steel, covered with pure copper. The strength of the wire compares with best No. 5 iron wire, and the conductivity is fully equal to No. 7 iron wire, and yet the weight of the wire is but little more than one half the weight of No. 9 telegraph iron wire. Mr. Cary has recently made great improvements in his wire, and has made it incomparably superior to all other kinds for reliable telegraphing. His patent hooks and joints, for holding and joining the wire, have added to the last needed links in the compound wire chain to place its reputation far above and beyond all other forms of wire for telegraph conductors.

The best form of the Brooks paraffine insulators will also be used upon this line, and every third pole will have a substantial lightning rod affixed to it, and leading from twelve inches above to ten feet (coiled) below the ground end of the pole.

The line is to be worked by an entirely new and, as alleged, greatly improved Printing Telegraph Machine, invented by Foote & Randall, of this city, which is so simple that any person of ordinary intelligence can work it reliably after a few hours' practice, and, when manipulated by experts, a reliable speed, in circuits of 300 miles, of thirty to forty words per minute, is easily obtained. In the peculiar character of marine news reporting, consisting largely of figures and strange and sometimes unpronounceable names, which it is nearly impossible to telegraph correctly by the Morse system, the printing system will be a very great improvement, both in accuracy and speed, and we think the projectors of this line have evinced excellent judgment in choosing the printing in preference to all other systems of telegraphing, as correctness in names and figures are of first importance.

It is understood that Foote & Randall have also completed a very excellent reporting telegraph machine (also a printer), which the news room will soon be prepared to supply at a very low figure to all their patrons who may wish to be connected with the news room. This will be a great convenience to the underwriters and others who have need for the prompt delivery of marine news.

Among other novelties also about to be introduced at the news room is a new type writing and manifolding machine, for printing in plain Roman characters (large and small type) the reports which the rooms send out to their patrons every few moments through the day. The machine prints very neatly and with perfect accuracy in lines and pages, and at a speed twice as fast as can be written in manifold with a stylus. This machine will be likely to come into general use amongst all parties who, like the agents of the Press and others, have many copies of news, etc., to manifold.

With this hasty outline of the movements connected with the new line to Sandy Hook, who can say that the second and last line to that desert sand bank may not lead to quite as important results as the first line, which we have imperfectly sketched?

It is in order for our friends of the Western Union Company to begin to pick their flints and keep their powder dry.

The Route for the Pacific Cable.

A SECOND communication has been received at the Navy Department at Washington, from Commander Belknap, of the U. S. steamer Tuscarora, dated Ounaslaska Island, July 31. He says that five days were spent in making a *reconnaissance* of a portion of the Bay of Glory of Russia, Tanaga Island, which seemed to be the best adapted for the shelter of shipping and for the landing of the proposed submarine cable. The results of the soundings show that the water deepens rapidly the moment the land is left, until a depth of 3,754 fathoms is found about 110 miles west by south from Cape Lopatka, where the bed of the ocean begins to rise, forming a ridge between the shores of Kamtschatka and the Aleutians, the highest point of which is 1,777 fathoms below the surface. He states that he proposes to run a line south of this chain as far back as Tanaga before proceeding to finish up to the line to the point to the eastward, at which the soundings were discontinued last fall.

An occasional correspondent of the *New York Tribune* on board the Tuscarora, under date of Hakodadi, Japan, June 24th, sends that journal an interesting account of the soundings made to discover a practical route for the new cable. He says: "On the 8th day of June we left Yokohama, anchoring that night at Titiyama Bay, and upon the following morning at daylight the work of sounding was begun from the entrance to the bay. After rounding Cape King a line of soundings was run parallel with and from five to ten miles from the coast, until Cape Cho-osi was reached, and from thence the line gradually trended to the northward and eastward, following the great circle route to Cape Flattery. Everything was favorable with the exception of strong undercurrents until lat. 38° 11' N., lon. 144° 33' E. was reached, when to our great surprise no bottom was found at 4,643 fathoms (27,858 feet), at which depth the wire was carried away, undoubtedly by fouling the copper on the ship's bottom. The ascertained depth was over five miles and a quarter; of course it is impossible to say how much greater the depth actually was. It was evident that as this depth was found at only about 120 miles from the coast, the route proposed was impracticable, and to proceed further on it would be but a waste of time, and would unnecessarily risk the loss of more wire."

The route was abandoned and the ship was headed to the northward and westward and sailed to lat. 38° 13' N., long. 142° 07' E., where only 411 fathoms was obtained. Sailing thence, at the position lat. 38° 34' N., long. 142° 39' E., the depth was found to be 1,358 fathoms. A new line was run, nearly parallel to the coast, to Cape Kuro-Saki, lat. 40° N., long. 141° 51' E., and from that point to the northward and eastward. This route is about 100 miles to the northward and westward of the proposed great circle route.

On the line now tried, in lat. 42° 34' N., long. 140° 07' E., 4,340 fathoms (26,220 feet) depth was found, and the depths ran about the same to lat. 44° 55' N., long. 153° 26', where there was 4,655 fathoms (27,930 feet) of water, the greatest depth yet found; so for a distance of nearly 300 miles there was a plateau of over four and a half, and at some points five miles in depth. These results occasioned great astonishment, as the line is but about 100 miles from land, where, comparatively speaking, shallow water was expected. It is of course impossible to say what depth would have been found had we followed the great circle route proposed; but it is natural to surmise that there are still greater ones. This route, of course, was likewise declared impracticable, and nothing remained to be done but to seek one nearer the land. The ship, starting from the last station, lat. 44° 55' N., long. 152° 26' E., was headed to the northward and westward until lat. 46° 21' N., long. 151° 25' E., was reached, a position about 30 miles due east from Cape Kastriem, which is on the northern end of Urup Island of the Kuril group. From this position a line was drawn skirting along the Kuril group and meeting the second line in lat. 40° 09' N., long. 144° 01' E. Thence we proceeded to this place to replenish our coal bunkers. The depths on this line are moderate and favorable to the end in view. It remains now to see what the continuation of it to the Aleutian Islands may divulge.

To give some idea of the intense pressure at these great depths, which at about five miles beneath the surface is over five tons to the square inch, I shall mention its action on one of our thermometers. These thermometers are made especially with reference to deep sea operations, the glass stems and bulb being partially enclosed in ebony and then in a strong copper cylindrical case. One was sent down in 4,340 fathoms of water, and upon its return to the surface the ebony covering of one bulb was broken into pieces and the bulb itself and stem into small particles. Very interesting observations were made regarding the currents. It was especially remarkable how distinctly they were defined by temperatures. It was determined that the depth of the Japan stream was about eighteen fathoms and that itself was to the northward

and eastward. The depth of this stream, it will be remembered, was found to be about the same of our Western coast. Below this depth there sets to the southward, following the contour of the land, a cold polar current, which extends to the surface as a counter current along the shores of the Kuril and Japan Islands, and is on the surface from thirty to fifty miles in width. On our western coast, in passing from the surface to the under currents, the changes of the thermometer were very gradual, and, comparatively speaking, slight: here the temperatures fell over six degrees between fifteen and twenty fathoms depths. Also, in passing from the Polar counter to the Japan stream the temperatures rose in one hour (during which time only about five miles of water was passed over) 10°, *i. e.*, from 50° to 60° Fah.

The Japan stream on its northern and western borders, or rather on the line run by us, lost in a distance of about 800 miles from the Japan coast about 20° Fah., the temperature being from 60° to 65° at five miles from the coast, and in lat. 44° 55' N., long. 152° 26' E., 41° Fah. This great fall is easily comprehended when it is considered what influence cold air above it and a cold current of water of about 33° Fah. only eighteen fathoms beneath the surface must have on it. There were found to be but slight variations of temperature from twenty fathoms depth to the bottom, no matter what was the depth."

[From the Buffalo Sunday Morning News.]

Bryant's Big Humbug.

Editor Sunday News.

The following advertisement I clip from the Buffalo Morning Express:

"BUFFALO TELEGRAPH COLLEGE.

"Young Men and Ladies qualified for practical operators at the Buffalo Telegraph College and City Line Telegraph. Every graduate secures a position. Operators' salaries \$50 to \$100 per month. Largest and most complete in America. Send stamp for 1874 Catalogue to C. L. BRYANT, Sup't, Buffalo, N. Y."

Telegraph Colleges and Institutes have been exposed by the telegraph journals, but as they only reach a small number of readers, generally operators. I will with your permission enlighten the public of Buffalo and vicinity, whom the above advertisement is liable to mislead.

Telegraphing has been brought to such perfection that it must be recognized as a business—a *trade*, as much as any other which requires time and patience to learn and skill to perform. These advertisements, circulars, etc., sown broadcast throughout the country, make it appear to people ignorant of the business that it is but child's play, and any one who wishes a "soft" job has but to enter a College and in two or three months be turned out a first class—or, to put in milder shape—a "practical operator." This is what I should call telegraphic lathe work or electric phenomena.

The "Sup't" is out of his sphere; there is a vacancy for him in the "Great Monopoly" as well as every railroad and telegraph company in the country, who are bothered with an infinity of impractical operators, and they would no doubt pay handsomely any individual who would straighten them out, in fact make them worthy of earning "fifty to one hundred dollars per month." I will simply take this advertisement, reserving the catalogue, which is more liable to deceive the uninitiated, for a future occasion if necessary.

"YOUNG MEN AND LADIES QUALIFIED, ETC."

Three or four years' steady practice in a telegraph office, if the person has the requisite qualities, will make him a first class operator. A "practical operator" is a "College" phrase, and may mean anything the "Sup't" wishes. To the minds of ordinary operators it means a "plug." A great many men would spend fifty years at the business and still be nothing but "plugs," although every old stager, in his own estimation, is a 1.

How does this tally with the information an unsophisticated applicant would receive at the Institute?

"Every graduate receives a position." Where? On the street corners, or on the "City Line Telegraph?" What telegraph, railroad company or corporation has the "Sup't" a contract with to supply operators? There are ten thousand telegraph offices in the United States and Canada, and on an average each office has one student; here are ten thousand applicants, I might say, every two years. Will not the companies prefer them to College graduates? A first class operator can always secure a situation in some part of the country, a "practical" operator cannot; the country is overrun with them; they are thick as flies on a putrid carcass, and a stench in the nostrils of every telegraph superintendent and manager in the Union.

"Operators' salaries \$50 to \$100 per month." There are probably one hundred operators in Buffalo (Colleagues not counted) and not six in the hundred receive the latter amount, managers and chiefs excluded. The six are like "the last of the Mohicans," the remnant

of a race, and when they resign or die out—not intending a pun—their figures will go with them.

The average pay of railroad operators in this State is about thirty-five dollars per month. The N. Y. C. R. R., the richest corporation entering Buffalo, will not average over thirty as the magnificent recompense of the telegraphic employes. Of course, where the operator does station work and extra duties, he receives more.

For those wishing to learn I would say there is no scarcity of operators, the supply far exceeding the demand. "A complete outfit for a telegraph office with manual" may be obtained of Geo. H. Bliss & Co., Chicago, for seven dollars. This is a sufficient outfit for the student. He can be his own teacher and learn as much about the business as any Colleague in the country will impart to him. There are other dealers in New York, Baltimore and Philadelphia, but I do not remember the addresses; they can be obtained at any telegraph office in the State where the *Journal of the Telegraph* or *The Telegrapher* is taken.

The Western Union has a business office in Cooper Institute, New York, where students are taught free, and, when found competent, given situations. Were there a scarcity of operators the same company would doubtless establish schools in all the large cities.

In conclusion, I would say that I have no intention of attacking any legitimate business. I consider the advertisements and pretensions of Telegraph Colleges as an insult to every intelligent telegraph operator, lady or gentleman, who by years of patience and hard work have obtained positions which institutions of this character, by their appeals for patronage, are liable to make the public think could be filled by any dough-head who had money enough to pay for three or four months' practice on their toy wires.

TELEGRAPH OPERATOR.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Status and Condition of Railroad Telegraph Service.

TO THE EDITOR OF THE TELEGRAPHER.

THE connection between the railroads and telegraphs has become so intimate, and the operations of the former are so controlled and regulated by the latter, that a railroad without ample telegraphic facilities, except in the New England States, has become an anomaly. Necessarily from this fact a very numerous class of telegraphers has grown up, devoted especially to the telegraph service.

It is not too much to say that the railroad telegraphers as a class are not adequately compensated for their services. The interests dependent upon their reliability and faithfulness are so important that the service should command the best talent in the business. It cannot do so while the average compensation of railroad telegraph employes is so much below that paid for corresponding services on commercial lines. It is not intended to assert that there are not many first class telegraphers employed in railroad telegraphy, for this would not be true. It is also true that the average of ability of the railroad telegraphers has advanced during the last few years. The time was when it was rather a reproach to be ranked as a railroad telegrapher, but this is no longer the case. Still, there is not that care exercised in selecting persons for this service which there should be, and it is considered more essential that the compensation demanded and received should be small than that the employes should be properly qualified and instructed.

When it is considered that the interests of property and life confided to these employes are of so important a character, the impolicy of such a course will be readily understood. A single blunder or instance of carelessness may in an instant not only result in the destruction of a large amount of property, but also in the loss of life, which otherwise might have been safe. This is no supposititious case, for such accidents and destruction have occurred from this cause. It is probably of not much use to expect a general improvement in this respect while the railroad business is as depressed as it has been for the past year, but it will do no harm to ventilate the subject, and bring it to the attention of the higher powers.

As a class, I believe the railroad telegraph operators are meritorious and worthy, and render more than adequate service for the compensation received. It is in their interests, as well as those of the railroad companies and the public, that I have brought up the matter, and hope that they will generally give us, through *THE TELEGRAPHER*, their views and ideas on the subject. There are enough railroad telegraphers to organize an

association for themselves, which shall be for mutual protection and benefit, and for the advancement of their interests and the elevation of the professional standard of those employed in this department of the telegraph. I believe that if a movement in this direction were undertaken by parties generally known, and who have the confidence of the employes, it would meet with almost universal encouragement. Cannot something of this kind be done?

I am not myself a railroad telegrapher, but have known a good many of them and the inadequate compensation accorded for their services, and desire that a reform should be initiated, not merely in the interests of the employes themselves, but of the roads and of the public as well. The time is not distant when the transportation interests of the country will recover from the depression under which they are now suffering. This depression can be but temporary, and the future of the railroads, as well as the telegraphs of the country, is destined to be a prosperous one, and in that prosperity every employe should participate.

JUSTICE.

The Use of Tobacco and Intoxicating Liquors Condemned.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE too good an opinion of "Tom's" intellectual abilities to believe for a moment that he really misunderstood my meaning, as he pretended to—it was evidently enough the contrariness rather than the gallantry of the men that I depended upon for the abolishment of tobacco. I am afraid the latter would, in too many cases, be but a poor dependence. As to counting on their "established custom of giving up everything for the sake of peace," I am very sure I did not, for I never heard of such a custom. Mr. Tom evidently thinks he is quite safe in offering me that pet little pipe of his should I learn to use it. It was, however, a rash offer: I should certainly have accepted it, but that I would not willingly cause any one so much sorrow, and especially to one so forlorn as he must be, without sister, wife or friend. It would be too cruel to deprive him of his only companion, the solace of his lonely life. But, seriously, though I can tolerate the use of tobacco I cannot of intoxicating liquors, and I am sorry to hear "Tom" speak so lightly of it as he does. I would be inexpressibly rejoiced to see every member of our profession total abstainers—not moderate drinkers. I don't believe in them at all—sooner or later they come to the same thing. As to billiards, I know nothing of the game. I have no doubt it is a very good game and very harmless in itself, but, as a means of gambling, I protest against it. Gambling and drinking go hand in hand, and they are, separately and together, the sources of more than half the misery and sorrow in the world.

I suppose "Tom" will say I must be some intolerant and prejudiced old maid. I am not an old maid, nor do I think I am intolerant, but it grieves me deeply to see so many of my gentlemen friends giving themselves up to this hateful practice of "tippling." I suppose you think that as long as you do not take enough to affect your senses your lady friends will never know it. I can tell you you are mistaken; you cannot take a single drop but we can detect it the moment you come near us, and if you only knew how saddening the discovery, and how disagreeable the effect, I do believe you would try not to inflict it on us so often. I make due allowance for the temptations you are all subject to—that it is considered "the thing" to ask a "fellow" to "have a drink" when you meet him; but, surely, there is such a thing as resisting temptation and overthrowing a most detestable fashion. I think I will subside for the present.

ELINOR.

A Frightened Telegrapher.

CALIFORNIA, Sept. 2d.

TO THE EDITOR OF THE TELEGRAPHER.

WE had been talking about ghosts, and one of us had capped the climax by telling a true (?) story, which happened near home, of some ten or twenty Chinamen who had been killed by a cave in a tunnel, not far from where we were seated, and been buried under the engine house, some thirty or forty yards from the office.

He made the remark, casually, it seemed, that a something was in the habit of striking on the smoke stack of the engine in the "wee sma' hours of the morning," and at one time had rivalled all past manœuvring by actually appearing to the night watchman and ringing the bell of his engine.

As the mystery was still unfathomed, our historian hesitated to express his opinion as to who or what it was, but left it to us to form each an opinion for himself. The man who "pounded brass," nights was considerably worked up, and as we prepared to retire we noticed him carefully priming his old horse pistol and putting on fresh caps. We thought no more of it till morning, when we were informed that the "Morser" had seen a hard night, as, according to his story, about

the time "when graveyards yawn" he heard an unearthly yell and a wild rush into the office, followed by the slamming of doors. Looking up he espied Ned C—, the track walker, braeed up against the door as though an army were demanding admittance, and a most diabolical smile on his phiz, as he remarked:

"You can't come in here alive!"

Somehow Ab. couldn't cock that pistol of his, no matter how hard he tried, as his teeth were chattering in a vain endeavor to rival the trembling of his hands. As soon as the excitement of the moment passed Ned ventured to look out, and saw the unwilling cause of the scare, which proved to be a harmless and playful pup, who, attracted by the light carried by Ned, had followed him from tunnel thirteen in an unsuccessful effort to overtake him, for as soon as our hero discovered he was followed he accelerated his speed until it amounted to a flying jump as he crossed the threshold of the office. We cannot conjecture where Ab. was the rest of the night, but we hear G. T. W. swear he couldn't raise "Sm." with a "9" for No. 6 until after she reported passing Cisco, having met No. 5 at Tamarrack. ONE WHO WASN'T THERE.

The West Wisconsin Railway Telegraphers.

EAU CLAIRE, WIS., September 2.

TO THE EDITOR OF THE TELEGRAPHER.

HAVING seen nothing in your paper from this corner of Wisconsin since I have been a subscriber to *THE TELEGRAPHER*, now nearly two years, I have concluded to give some account of the telegraphers employed on the line of the West Wisconsin railway.

Commencing with our popular train despatcher and circuit manager, Mr. Hugh Spencer, whose office is at Hudson, we find as whole souled a gentleman as has ever been my lot to answer calls for.

Mr. Charlie Kittredge, who handles the key as day operator in that office, is a good operator and does the railroad business up in fine style. "Coon. Prairie Jack" does the business at this office when all is still and clear.

Mr. Kingsley holds forth at St. P. & P. Junction in good style. At the other end of the wire, at Elroy, we find Mr. Pierson, who is a good fellow.

Mr. Kearney at Camp Douglas, just in from the prairies of Michigan, is quite a popular telegrapher, the only objection to him being that he is a Britisher, born near Liverpool, England.

At B. R. Falls, Mr. Joseph Harris manipulates the key with grace and elegance combined.

Mr. Cuddy runs things at G. B. Junction, and in first rate style; and last but not least, comes Mr. Will Rudd. He is the operator that copied "Ist Paul brass" for "send me I St. Paul brass." In amazement he was discovered wondering "what that fellow meant." FRENCHY.

To Correspondents.

L. E. M., Charleston. The communication of the Major will hardly answer for *THE TELEGRAPHER*.

Miscellaneous.

MAGNETO-ELECTRIC MACHINES.—The magneto-electric machine recently introduced in Paris appears to be a valuable improvement on other machines of its class. It gives a continuous induced current, the rotation given to the coils is three hundred and fifty revolutions per minute, the driving power required is from two and a half to three horse power, and the current developed is represented to fully equal that of five hundred and twenty-five Bunsen cells. The luminous and calorific effects produced by this apparatus may be judged of by the statement that a light has been obtained by it whose brilliancy was nearly equal to one thousand carcel burners—that is, between nine and ten thousand sperm candles—and a light, equivalent to nine hundred burners, was emitted during a series of experiments extending over several hours; the spectrum afforded by such intense illumination exhibiting, as might well be supposed, a number of notable features in various lines never before observed. Compared with other machines, when employed for light-house purposes, this is found to take up but one fourth the room, gives double the light for the same expenditure of power, and for the same light is only half as expensive. It is well known, too, that one of the most recent and celebrated machines of this kind, of English invention, driven by a fifteen horse power—the armature making from 1,500 to 2,000 revolutions a minute—achieved a great feat when it fused a platinum bar two feet long and twenty-five inches in diameter; but this French apparatus, driven by a three horse power, the coils rotating at the rate of 350 revolutions per minute, will fuse almost instantaneously an eighteen gauge platinum wire of eight feet in length, and a piece of a round file, one half inch in diameter and four inches long, was burnt away in five minutes.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS OF THE TELEGRAPHIC FRATERNITY.

SATURDAY, SEPTEMBER 12, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

TERMS OF SUBSCRIPTION.

One Copy, One Year, - - - - \$2.00.

INVARIABLY IN ADVANCE.

Single Copies Five Cents.

Any person who may procure four new yearly subscriptions, or their equivalent in shorter subscriptions, will be entitled to receive a copy of the paper for one year free.

In lieu of the above, or any other premiums that may be offered from time to time, telegraphers, or others, who may act as agents and canvassers in obtaining subscriptions, if they so desire, will be allowed twenty per cent. commission on the amount collected, which may be deducted from the remittances for such subscriptions.

SPECIMEN COPIES FORWARDED FREE on APPLICATION.

Communications must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503.)

38 VESEY ST., New York.

Special Notice.

The legal rate of postage on THE TELEGRAPHER, addressed to its regular subscribers, is 20 cents per annum, or 5 cents per quarter, payable in advance. Subscribers who receive their copies by letter carriers will please hand the annual or quarterly postage to the carriers, taking their receipts. If any higher rates are demanded, report the facts to the local Postmaster. The postage on copies directed to subscribers in New York City has been prepaid by the publisher.

Back Numbers Wanted to Complete Files.

THE supply of the following numbers of THE TELEGRAPHER is exhausted, and we are desirous to obtain them to complete files of subscribers. Any one who may have either of them that can be spared will confer a great favor if they will forward the same to this office:

- Vol. IX, No. 342.....4 copies.
" " " 351.....2 "
" " " 352.....1 "
" X, " 391.....4 "

Seasonable Considerations.

THE summer season is over, and, although we may expect some warm, perhaps hot weather yet, still the shortening days and lengthening evenings and nights forcibly remind us that the harvest season has come, and that very soon we may look for the chilling winds and frosts which usher in the winter.

Business, generally, is reviving and putting on a more cheerful appearance. The prospects are encouraging for the future, and there is good reason to believe that, so far as the panic and the subsequent business depression are concerned, we have witnessed the worst.

We would remind the telegraphic fraternity and the friends of the telegraphers' representative, THE TELEGRAPHER, of the necessity for renewed exertions to increase the subscriptions to the paper. The summer is always a dull season, so far as subscriptions are concerned—a fact which is easily accounted for. Now that the summer is over, we look for the usual fall

revival of interest in THE TELEGRAPHER, and the reception of a handsome addition to the number of subscribers to and readers of the paper.

We rely upon the active and persistent cooperation of the telegraphers themselves to enable us to maintain vigorously and effectively the paper which is published for and in the interests of the practical telegraphers of the country. They have hitherto not disappointed us, and, we have faith to believe, will not do so now. Let all who believe the effective support of the paper essential to the welfare of the telegraphic fraternity consider this statement, and respond with handsome lists of subscribers procured through their exertions.

Attention is called to the terms printed at the head of our editorial columns, and the liberal offer there made to those who may interest themselves on behalf of the paper.

Encouraging Telegraph Prospects.

THERE are very encouraging indications of prosperity of the telegraph interests in this country. The great telegraph company of the country, the Western Union, last week declared its second quarterly dividend of two per cent. on its capital stock, and it is stated that there is no probability of another suspension of dividends so far as that company, at least, is concerned. And not only so, but it is privately given out that the annual report to be made to the stockholders, in October, will show a highly prosperous condition of the company. Upon these reports its shares have advanced to about eighty, and it is generally understood that they will be carried to even a higher figure before the annual meeting takes place.

The Northwestern Telegraph Company, which connects with the Western Union at Milwaukee, is also in a very prosperous condition, and under the active and intelligent management of its president, Mr. Z. G. SIMMONS, and its General Superintendent, Mr. CHAS. H. HASKINS, of whose ability as an electrician the columns of THE TELEGRAPHER have seen frequent evidence in his contributions to its columns, and who, in the West, is known as one of the most able telegraph managers in the country, has become one of the best and most reliable telegraphic organizations in the United States.

We are also informed that the Atlantic and Pacific Telegraph Company is doing a very good and increasing business, and that its prospects are very flattering. The new line of the company between Chicago and Omaha, to connect its eastern and Pacific sections, is rapidly approaching completion, and will, doubtless, prove of great value and importance in the future to the company.

The Southern and Atlantic Company will, also, when its line is completed to New Orleans, become a leading and profitable telegraph organization, covering as it does the territory south of Washington, as the only company competing with the Western Union for the telegraph business of that section. We understand that all necessary arrangements for continuing and completing its lines are nearly consummated.

We do not hear much of the Great Western Telegraph Company, but it is so involved in litigation that its chances of being maintained as a separate organization do not appear to be very encouraging. Still, it is possible that it may work clear of its legal complications and become an important part of the telegraph system.

The Automatic Telegraph Company is, as we are informed, doing a good business on its wire between New York and Washington, and, it is to be hoped, may, before long, be extended so as to cover a larger extent of country. The day for comparatively short telegraph lines to prove permanent and profitable in this country has gone by. Only those companies which are progressive, and cover a considerable extent of territory, can expect to prove permanently successful.

All those telegraphic organizations outside of and competing with the Western Union should be consolidated into one strong company, and must be eventu-

ally. There is room and demand for two powerful and national telegraphic organizations, which by reasonable and intelligent competition shall regulate each other and satisfy the public. The Western Union supplies one of these, and if the companies competing with the Western Union can be brought under one organization and management they will supply the other. This should have been done long before this time, but the obstacles in the way of such a consolidation are numerous, and some of them difficult to be overcome, but we believe that eventually they must be.

Two such competing organizations could do the telegraph business of the country satisfactorily, be able to adopt new and useful improvements in telegraphy, satisfy the public, work advantageously for the employes, and prove reasonably remunerative to the stockholders. There is every reason why such a consolidation as we have persistently advocated should take place, and no good reason why it should not be effected.

It gives us much pleasure to record this flattering and satisfactory improvement in the telegraphic prospects. It indicates further returning prosperity to the country, and a general though gradual revival of business enterprises. Investors in telegraphic enterprises have not, of late years, found them very remunerative legitimately, and it is time that they should again become so.

There has been a very general suspension of telegraphic construction and reconstruction during the past year. This condition of things naturally could not last very long, and unless some unforeseen financial and commercial disaster shall intervene, we expect, with the next year, to witness a renewal of telegraphic enterprise and extension which will be required to meet the constantly increasing demand for telegraphic facilities. This country can never long stand still or be paralyzed in its industrial and commercial enterprises. Severe as has been and yet will be the lesson taught us by the panic of a year ago, and the consequences since, it will in the end prove largely and permanently beneficial to the country. We were going ahead too fast, and it required some such rude shock to check us in our career, lead us to examine the situation, and once more establish ourselves upon a sounder basis. Unavoidably much suffering and disaster has resulted from it; but the country, as a whole, is and will be in a better and sounder position for the puncturing of the bubble and the enforced economy which it has caused.

While the indications are propitious, we are not yet entirely out of the woods, and it will be necessary for us to proceed cautiously and slowly in rebuilding the waste places and reestablishing ourselves in our former position financially and commercially. This will apply to the telegraph as well as other lines of business, and we are inclined to think that those who are engaged in and responsible for telegraphic management appreciate this fact.

The Effective Way to Do It.

WE reprint from the Buffalo Sunday Morning News a communication exposing the falsehoods and absurdities of the advertisements and circulars of a local so-called Telegraph School in that city. This is the proper manner in which to reach such establishments and those who patronize them. Their proprietors and managers care very little for what telegraphic journals proper may say about them or their business, because the class that patronize them, and from whom they derive the means to procure their whiskey and provisions, seldom see or know anything about such journals. They read the lying advertisements which are spread abroad through the columns of the country press, are attracted by the inducements held out, send for a circular and the business is done. Exposure like that which we have copied and referred to is much more effective, because it reaches the notice of those who are hesitating whether to invest their time and money or otherwise, and in most cases will be the means of saving both.

How this particular plug factory obtains its telegra-

phic instruments for the pupils it succeeds in inveigling, our friends, L. G. TILLOTSON & Co., know to their cost, and the facts have already appeared in THE TELEGRAPHER. We presume, however, it is no worse than the generality of such establishments, and what is said of one may be said of nearly all of them. The best way is to have nothing to do with them. If there were any necessity for the introduction of additional operators into the telegraph business the telegraph companies and managers would see to it that the demand was fully supplied. At present the number of those who consider themselves, and who generally rank as telegraph operators, is largely in excess of the demand, situations, except for those who are really good operators, are difficult to obtain, and salaries, as a general thing, tending downwards. There is no demand or necessity for additions to the telegraphic ranks at present, and if there were, at least twice as many are learning in the telegraph offices throughout the country as will be likely to obtain situations. So, save your time and money, students, and don't credit the statements of lying advertisements and circulars that the managers of telegraph lines are anxiously awaiting your applications for situations, with a diploma from some telegraph plug factory that you can send or receive thirty words per minute. There's no truth in it, and your reception with one of these Telegraph College diplomas would most likely be anything but pleasant, for their real value and truthfulness are well known on every respectable telegraph line in the country.

The New Telegraph Line to Sandy Hook.

WE print this week on our first page an account of the new line which is being constructed from this city to Sandy Hook, for marine reporting, which will be found of interest. This line is being constructed under the direction and superintendence of Mr. WILLIAM H. HEISS, whose telegraphic record is an excellent one, and who knows how to construct a first class telegraph line if anybody in the country does. We are informed that no effort or expense will be spared to make this in every respect a model line.

This line is being constructed by the New York Merchants' Exchange and News Association, which is located at 113 Pearl and 56 Beaver streets, and which has been in successful operation for nearly fifteen years under the immediate management of Mr. JOHN C. SMITH, Superintendent. There has been for some time past growing dissatisfaction with the facilities afforded by the Western Union line, now in operation to Sandy Hook, which has finally led to the inauguration of the new enterprise.

The history of telegraphing from Sandy Hook, and its important bearing on news monopolies heretofore, are fully set forth in the contribution to our columns to which we have referred, and the facts in reference to the present and former telegraphic enterprises are so fully stated as to render unnecessary any additional details.

We are informed that the new line will start under most favorable auspices, and as many of the patrons of such a line are interested in it, it will, without doubt, at once secure a profitable patronage.

New printing instruments manufactured by Messrs. FOOTE & RANDALL, of this city, are to be used on the line, and a new feature will be the furnishing merchants and others with printing telegraph instruments connected with the News Room, so that they may be kept instantly and constantly advised of the marine and other news received there.

Is the Organ Silenced or Afraid?

YET another number of the Western Union official organ has made its appearance, and no attempt is made to afford us the information for which we hunger and thirst, and for which we have repeatedly and courteously asked our somewhat slow going contemporary in regard to Mr. STEARNS' duplex telegraph inventions. As the Official started in with unwonted juvenility and

sprightliness to pick up THE TELEGRAPHER on its supposititious endorsement of a communication which appeared in its columns, we supposed that now surely we were to be supplied with electrical and telegraphic wisdom in chunks; but alas! with but one glimpse of the glories within the door is closed, and we and the rest are left in utter scientific and telegraphic darkness. The Official has relapsed to the platitudes with which it feeds the weak and weakening intellects of those who look to it for mental and professional abulium, and we are constrained to mourn as those without hope. If the combined and concentrated wisdom of the electrical department of the Western Union Company can afford to confess its inability to maintain the positions assumed, perhaps somewhat recklessly, by its organ, why, we must submit with as much grace and resignation as possible; but surely it ought not to go back ruthlessly upon our duplex correspondent "BRAR," who, finding that after the first blast the wind of the Official organ appeared to be somewhat exhausted, took his case directly to the organ for consideration and discussion, and was eventually compelled to return to THE TELEGRAPHER for consolation and ventilation. To its columns all are welcome, and while we do not profess to endorse everything which we print, we are willing to give everybody a chance to advance and sustain their views.

The New Atlantic Cables.

THE interruption to cable communication has prevented, up to the time this is written, the receipt of definite information as to their progress. The new Anglo-American cable has, no doubt, been completed.

The direct cable should also, by this time, be well on its way to the Newfoundland coast, and by the time our next paper is issued we expect to be able to announce the successful laying and operation of that cable also. The station at Torbay, Nova Scotia, has been finished, and the employes have taken possession of it, and are ready to commence business as soon as the connection is made off the Newfoundland coast.

Congress and the Postal Telegraph.

IT is not our intention to inflict a regular postal telegraph screed upon our readers this hot weather; this we fear may necessarily become the burden which they will have to bear some months hence; but, at present, we purpose only to call attention to the fact that the subject of a Government telegraph proprietorship and management is only slumbering, but by no means defunct. The members of the Congressional committees are yet kept in mind of the topic by the receipt from the public printer of sundry exceedingly heavy and dry documents, printed by order of Congress, which they are expected to carefully peruse and collate preparatory to framing another lengthy and ponderous report to add to those which have already accumulated. Near the close of the last session Mr. GARFIELD gave notice that he should ask that the subject be finally disposed of at the coming session, and it is to be hoped that it will be so effectually that we shall hear no more of it for years to come. Favorable action is impossible, whatever committees may report or interested parties argue, and that fact being recognized, the whole subject may as well be laid upon the table and its further consideration indefinitely postponed.

Personals.

Mr. A. J. PATTISON has resigned the position of night manager of the Dominion Tel. Co., at Toronto, Canada, and accepted a position with the Atlantic and Pacific Tel. Co. at Syracuse, N. Y.

Mr. J. B. SPALDING has resigned his position with the Western Union Tel. Co., at Baltimore, Md., and accepted a position with the Atlantic and Pacific Tel. Co., at Syracuse, N. Y.

Any information concerning the present or probable whereabouts of Mr. WM. H. AUSTON, a native of San Francisco, Cal., aged about twenty years, and a telegraph operator, will be gratefully received by his friends. When last heard of he was in the employ of

the Western Union Tel. Co., at Omaha, Neb. Any information in regard to him may be addressed to Mr. JOSEPH B. AUSTON, P. O. Box 1,463, San Francisco, Cal.

Mr. J. N. CRITTENTON, of the W. U. Chicago office, was in New York on Monday last on a vacation. He started Monday night to return to duty, having enjoyed his temporary relief from duty and experienced much benefit therefrom.

Mr. W. W. BURHANS has resigned his position with the Southern and Atlantic Telegraph Co. at Washington, D. C., and accepted a position with the Atlantic and Pacific Telegraph Co., at 198 Broadway, New York.

The Telegraph.

By Cable.

THE NEW ANGLO-AMERICAN CABLE.

LONDON, Sept. 5.—At noon yesterday the Great Eastern had paid out 1,534 nautical miles of the Anglo-American cable. She was then in latitude 51 deg. 30 min. north, longitude 47 deg. 35 min. West. All was going on well.

STEAMSHIP GREAT EASTERN, Sept. 5, noon, via London, Sept. 7.—One thousand six hundred and ninety-six nautical miles of cable have been paid out.

Sept. 6—5 o'clock, A. M.—We are close to the Skellys, and we are going to buoy, and hope to make the final splice to-day. The cable is in perfect condition.

THE UNITED STATES DIRECT CABLE.

LONDON, Sept. 7.—The work of laying the new direct cable from the Irish to the American coast has commenced, and the following despatch from the steamer Faraday reports the progress made:

"STEAMER FARADAY, Sunday, Sept. 6, 1874.

We spliced the deep sea cable with the Irish shore end on the 3d, and had payed out 330 knots, when a fault was discovered on the 4th. It was found that a wire had pierced the gutta percha. While we were overhauling the cable it got entangled in some wreckage, broke, and was lost in 2,570 fathoms of water. The grappling apparatus was set at work and the cable recovered. The insulation is now perfect. We are in latitude 50° 51', longitude 17° 34'."

Interruption of Telegraphic Communication with Europe.

FOR the first time in several years telegraphic communication between the United States and Europe was completely interrupted on Tuesday last. The French cable between Duxbury and St. Pierre was broken, and a break was reported east of North Sidney on the Cape Breton lines connecting with the Anglo-American cables. The cable despatches are sent to North Sidney, where a steamer will call for them from the East, and convey them to where the connection can be made with the Atlantic cables.

There are three cables in operation. One, the old French cable, lands at the Island of St. Pierre, South of Newfoundland, which is connected with Duxbury, Mass., by another stretch of ocean cable. The other two cables land on Newfoundland, and communication is thence continued to Sidney by two smaller ocean cables, each of which lands at the Island of St. Pierre. St. Pierre, therefore, is where all of the cables meet as at a common point. Now all that is known is that suddenly and without warning each of the cables was interrupted between the main land and this island. Mr. Gaines, the chief electrician, is at work at Sidney trying to locate the points of interruption.

The two lines between Sidney and St. Pierre are very close together, but the Duxbury cable approaches from the south, and is in proximity to the other cables only in the neighborhood of the island.

The interruption of communication continued for more than twenty-four hours, causing much anxiety and a large accumulation of business. The break in the lines communicating with the old cables was repaired at about eight A. M. on Wednesday. Much relief was experienced in commercial circles when it was found that the difficulty was not as serious as had been feared.

The break in the French Atlantic cable was also discovered late on Wednesday afternoon and communication restored.

The Reports on the Postal Telegraph Question.

THE congressional printer has completed the printing of the views of the Government, the Western Union Telegraph Company, and of others on the postal telegraph question. A copy of the document will be forwarded at once to each member of the Appropriation Committee, and the sub-committee on the subject, o

which Mr. Wheeler, of New York, is chairman, will prepare their report, in order that it may be acted on early in the next session. The committee has had this subject under consideration so long, and so much has been said *pro* and *con*, that it has been pretty well exhausted. Mr. Garfield stated at the close of the last session that he would ask the House to dispose of it finally next winter.

The Merchants' Exchange News Room and the Western Union Telegraph Co.

On Monday last some excitement was occasioned by the posting of a bulletin in the rooms of the Merchants' Exchange and News-Room, No. 113 Pearl street, announcing that the Western Union Telegraph Company had cut out the branch office heretofore maintained in the News Room for the accommodation of the merchants and others patronizing the room.

For some time past there has been much dissatisfaction existing between the Exchange and the telegraph company since the removal from Pine to Pearl street; it is alleged that the telegraph company have refused to furnish the accommodations required. On the 29th of July, Mr. Smith, the Superintendent of the Exchange, made a written complaint to Mr. Orton, the President of the Western Union Telegraph Company, against the company's arrangements in connection with the Exchange. It is stated that this was referred for investigation, which was made and the report returned to Mr. Orton. In the press of official business the matter was laid over. Receiving no reply, Mr. Smith again wrote to Mr. Orton about it, and about the same time it became known that an opposition line to Sandy Hook was building, on account of the lack of accommodation.

Upon learning this Mr. Orton ordered the operator to withdraw from the room, and the office was cut out on Saturday afternoon of last week.

On Tuesday last communication was established between the Exchange and Sandy Hook, by connecting temporarily the wires of the new line, as far as constructed, with those of the Atlantic and Pacific Telegraph Company. The new Sandy Hook line is being pushed forward very rapidly, and it is expected to be in operation by the first of October.

Foreign Telegraphic Notes.

The telegraph line to Merida, Yucatan, Mexico, will be completed by the 16th of this month. This will bring the capital into direct communication with Merida, and the event will be celebrated with appropriate ceremonies.

In the House of Assembly of South Africa, July 13th the Submarine Telegraph Bill was again considered in committee, when it was agreed to substantially as introduced by the Government. It appears that the contractors, Messrs. Hooper & Co., had requested the Government to release them from that portion of their engagement under which they were compelled to carry the line to Aden, and asked permission to make their terminus in India or Ceylon. Under these circumstances the bill was introduced, making the concession asked for.

The Legislative Assembly of New South Wales has approved of an agreement for the construction of a telegraph cable between New Zealand and New South Wales, and one between Normantown, in Queensland, and Singapore.

Great rejoicings took place in Chili on the completion of telegraphic communication with Europe, which occurred August 4th.

The line of telegraph in Chili to the frontier of Auranca was completed on the 21st July.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st, 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended Aug. 18, 1874, and bearing that date.

154,214—ELECTRO-MAGNETIC GOVERNORS FOR STEAM DRYING APPARATUS.—J. M. Bradford, Portland, Me., assignor of one third his right to Z. K. Harmon, some place. Filed Jan. 31, 1874.

Thermometers in kiln or drying rooms. One circuit closed thereby operates valve reverser; circuit closed by other controls valve to engine working pumps and valves.

1. The combination of a regulating valve, a reversing engine, and mechanism for working the valve, and an electrical circuit for controlling the reversing apparatus, with the feed pipe of a steam heating apparatus and a thermometer in the heating chamber, substantially as specified.

2. The combination of a cut-off valve with the regulating valve, reversing engine, electrical reversing circuit, feed pipe to the heating apparatus, and a thermometer in the heating chamber, substantially as specified.

3. The combination of stopping and starting mechanism, substantially as described, and the electrical circuit for controlling it, with the engine, regulating valve, and a thermometer in the heating chamber, substantially as specified.

4. The combination of the cut-off valve and reversing valve, rod I, collars s n, pawl m, magnet r, armature g, and thermometer k', substantially as specified.

5. The combination of the circuit for controlling the stop valve mechanism with cut-off valve and reversing valve mechanism, substantially as specified.

6. The combination of the magnet d, lever g1, and armature lever f1 with the stopping and starting valve M, substantially as specified.

154,258—TELEGRAPH INSULATORS.—Chas. L. Le Baron, Pensacola, Fla. Filed June 11, 1874.

Insulator held on spike by the spring of the split arms b' b' of spike.

The combination, with an insulator having an inwardly tapering central and bottom hole, a3, of an angle spike, having the elastic prongs b' b' on the short arm, as and for the purpose set forth.

154,309—ELECTRO-MAGNETIC STATION INDICATORS.—Charles W. White, New York, N. Y. Filed Feb. 28, 1874.

Two sets of electro-magnets, pawls and ratchets, working the indicating ribbon in opposite directions, there being a complete circuit for each set of electro-magnets. A retaining or holding device (ratchet M', pawl M, and levers N) is worked by either set of electro-magnets.

The combination, with shaft E, ratchets E2, and pawls F, of the ratchet M', check pawl M, and levers N, arranged as and for the purpose specified.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

SEPT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
3	77% 78%	16 16	.....
4	77% 78%	16% 16%	.....
5	78% 78%	16% 16%	.....
7	79 79%	.....	.....
8	79 79%	16% 16%	.....
9	79 79%	16% 16%	.....

Married.

MURRAY—FOSTER.—At Edgebrook, Botetourt Co., Virginia, August 19, by the Rev. P. L. Fellows, KENTON C. MURRAY, Manager S. and A. Telegraph Company, Mobile, Ala., to Miss ADA B. FOSTER, of Edgebrook. We congratulate the newly married couple. May they enjoy long life, and their only crosses be little ones.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

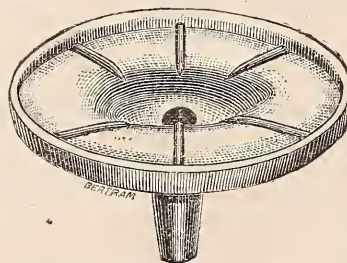
New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents.
UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	105 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use.

Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities.

A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

ANDERS' MAGNETO PRINTING TELEGRAPH INSTRUMENTS.

These instruments require

NO ACIDS OR CHEMICAL BATTERY,

the currents required to operate them being generated from PERMANENT MAGNETS.

They print very rapidly, and having been fully tested on private lines during the last eighteen months, have proved to be

VERY RELIABLE.

The following parties, among others, have purchased them after giving them

THOROUGH TRIALS

on their several lines:

THE BOYNTON PACKING COMPANY, Boston, Mass.
CHAS. HULBERT, Esq., 8 Exchange Place, Boston, Mass.
THE BOSTON AND ALBANY RAILROAD CO., Boston, Mass.
MESSRS. J. H. CHADWICK & CO., Boston, Mass.
JAMES ALEXANDER, Esq., Agent Cunard Steamship Company, Boston, Mass.

CHAS. S. LOVERING, Esq., Treasurer of Whittenton Mills, Taunton, Mass.

HON. ISAAC BRADFORD, Mayor of Cambridge, Mass.

GEO. H. COPELAND, Esq., Chief of Police for the Cambridge Police Telegraph, Cambridge, Mass.

We also continue to manufacture

ANDERS' MAGNETO DIAL TELEGRAPH INSTRUMENTS.

which have been extensively used for several years, and are recommended as the

BEST DIAL INSTRUMENTS MADE.

Parties who purchase either our PRINTING OR DIAL INSTRUMENTS can exchange one for the other at any time, as both the Printers and Dials are used with the same transmitters.

WELCH & ANDERS,

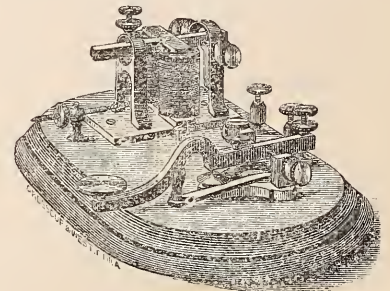
30 HANOVER STREET,

Boston, Mass.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,

WAVERLY HEIGHTS, PENNSYLVANIA.

PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Calland Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

If money be sent in advance by registered letter. 12 00

Instruments without Battery. 11 50

Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

SEND FOR CIRCULAR.

MESSAGE HOOK. \$5 PER 100.

For sale generally by

Dealers in Telegraph Goods. 75c. PER DOZ.



W. T. WESTBROOK,

WILMINGTON,

DELAWARE.

GLASS VISITING CARDS.

RED, BLUE, WHITE.

CLEAR AND TRANSPARENT.

Your name beautifully printed in GOLD on One Dozen for 50c.; post paid, three dozen, \$1.

Must have Agents everywhere.

Outfits, 25c.; Samples, 3c.

F. K. SMITH,

BANGOR, MAINE.



BUY THE BEST.

IF YOU WANT
EQUIPMENT
FOR A
TELEGRAPH LINE,
ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
and **QUALITY** THE **BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

L. G. TILLOTSON & CO.,

8 Dey Street, New York.

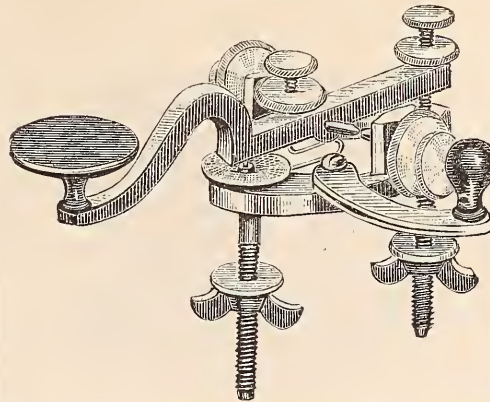
SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.

Acknowledged to be a decided improvement.

Price, same as the ordinary key.

Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"**BEST**" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,

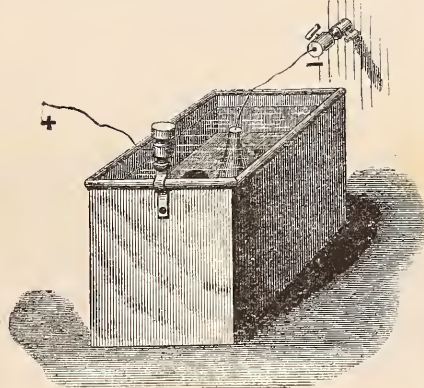
BROOKS' OR GLASS INSULATORS,

SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and **Labor at last Secured.**

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

P. O. Box 5004.

38 VENNY STREET, N. Y.

GEO. H. BLISS & CO.,
41 THIRD AVENUE.
CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

RELAYS unequalled for beauty and strength.

GIANT SOUNDERS, without a rival for clear, loud sound.

STRAIGHT and CURVED LEVER KEYS, warranted not to stick.

REGISTER SPRING and WEIGHT, of approved patterns.

POCKET RELAYS, in Hard Rubber Cases; new style.

BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.

IMPROVED COMBINATION INSTRUMENTS for main line.

RELAY, SOUNDER and KEY on same base, making an elegant set.

WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.

HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.

WESTERN UNION (new style) SWITCH BOARDS.

ELECTRIC BELLS, single or vibrating stroke.

MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR
KIDDER'S MEDICAL APPARATUS,
JONES' LOCK SWITCH BOARDS,
HILL'S ANNUNCIATOR and FIRE ALARM,
PUTT'S MECHANICAL INSTRUMENTS,
UNITED STATES ELECTRIC GAS LIGHTING APPARATUS.
POPE'S RAILWAY SIGNALS,
SELDEN'S PRINTER,
ANDER'S MAGNETIC DIAL and PRINTER
GROVE, CARBON, BUNSEN, DANIELLS, LECLANCHE, LOCKWOOD, CALLAUD, SMEE and GRENET BATTERIES.

AGENTS FOR
HILL'S and the EAGLE BATTERY,
KERITE and GUTTA PERCHA WIRES and CABLES.

AGENTS FOR
MOORE & SONS' and PHILLIPS' MAGNETIC and OFFICE WIRES.

AGENTS FOR
ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK, and AWL CLIP.

AGENTS FOR
WASHBURN & MOEN'S celebrated GALVANIZED WIRE; also, AMERICAN COMPOUND WIRE.

AGENTS FOR
BROOKS' INSULATORS,
KENOSHA INSULATORS,
SCREW GLASS INSULATORS,
TELEGRAPH POLES,
BRASS ECCENTRICS,
HAND VICES,
STEEL CLIMBERS,
STUBBS and PATENT FLIERS.

VAUGHAN'S AUGURS and TOOLS in variety.
SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID the finest in the Market.

TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.

SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.
Bliss' Manual and Price List furnished free on application.

GEO. H. BLISS & CO.,

41 THIRD AVE.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

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AND THE

PRESS

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NO EFFORT, TROUBLE OR EXPENSE

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RELIABILITY and
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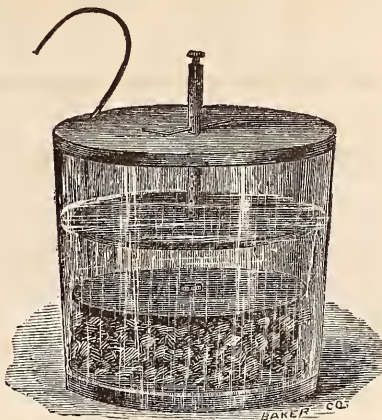
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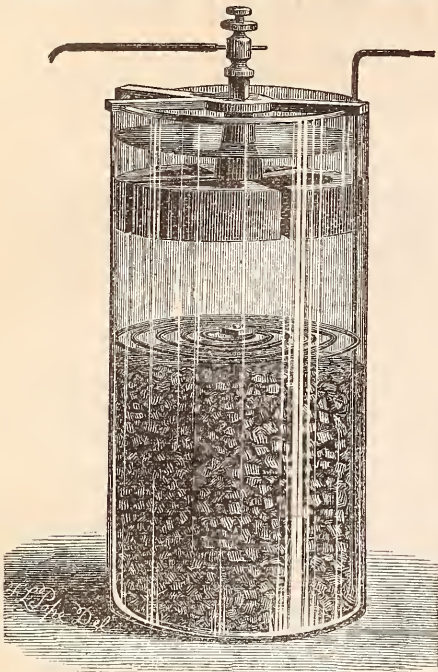
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

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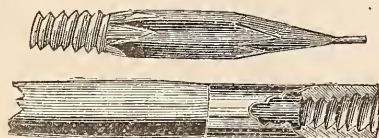
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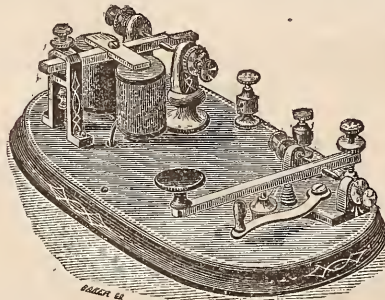
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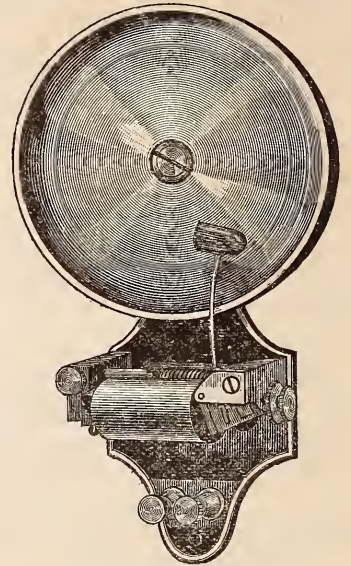
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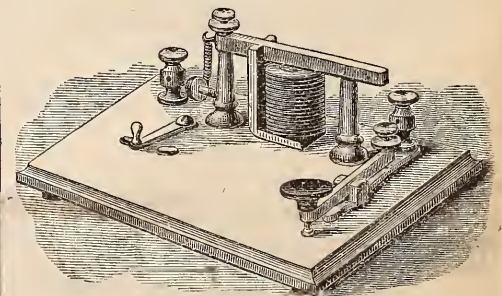
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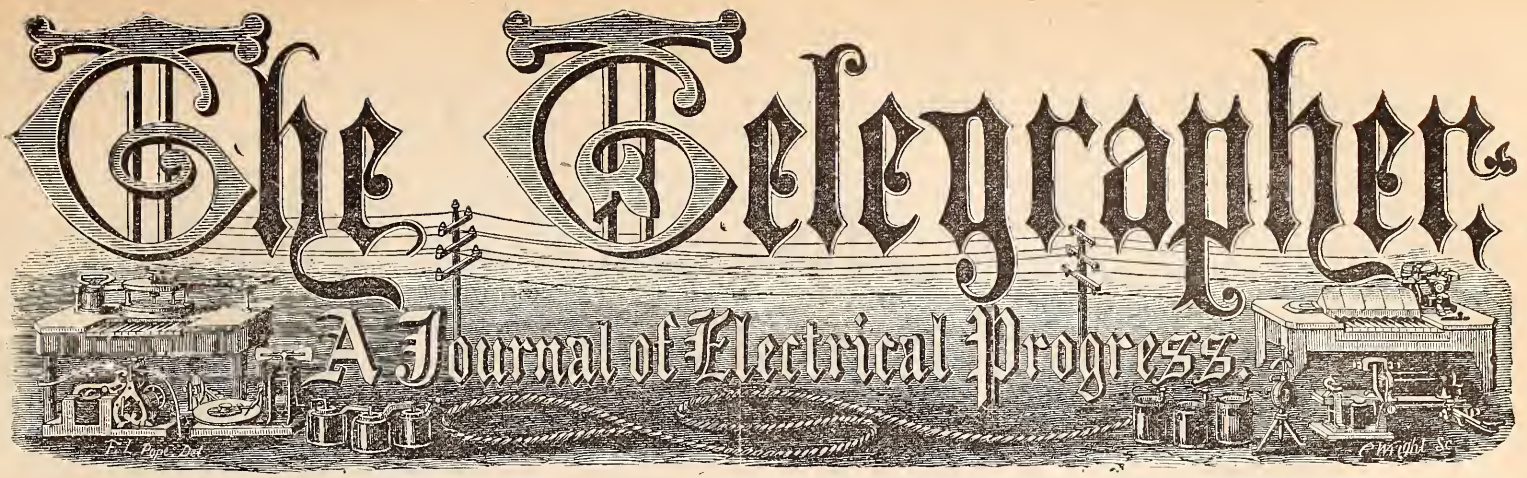
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, September 19, 1874. Whole No. 427

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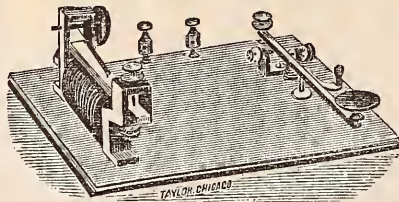
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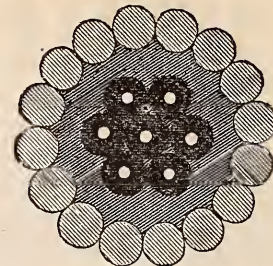
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, SEPTEMBER 19, 1874.

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Original Article.

Industrial Exhibitions.—Their Uses and Abuses, their Advantages and their Defects.

AS THIS is the season when industrial exhibitions or expositions are in fashion, it may not be without interest to consider their uses and abuses, their advantages and defects, and suggest some reforms in their management which would add to their value, and render their premiums, medals and diplomas of more reliability and importance in determining the actual standing of the articles and exhibitors for which and to whom they are awarded.

In this matter of industrial exhibitions we are displaying our national characteristic to the fullest extent—that is, we are, to use a popular and expressive saying, “running them into the ground.” Originally and for many years the Annual Fair and Exhibition of the American Institute in this city was the only one of any special account, and to it came everybody who had anything which was considered worth exhibiting, or for which it was desired to obtain the endorsement of an award of merit. The success of these exhibitions, however, eventually attracted the attention and excited the emulation of other cities and communities, until now there is scarcely a city of any size which does not have its annual show under some high sounding name, and invite, by an extensive system of advertising and a lavish proffer of premiums, the whole country to come forward and secure fame and fortune in their courts.

It is an old but true saying that “familiarity breeds contempt,” and it is not less so in this than in other matters. The awards of prizes, medals and diplomas at these exhibitions is very fast in the popular estimation degenerating into a farce, and they are coming to be regarded as of little value in determining the relative value and importance of competing inventions and manufactures. The exhibitor who fails to obtain an award at one exhibition has only to put in his claim at another, perhaps not a hundred miles distant from the first, and where he is pretty sure of not meeting his previously successful competitor, and his ambition or business venture may be rewarded by the success which was previously denied him. Or, if that be deemed the better policy, he can wait another year, and with a reasonable probability that, having already secured the highest award, his previously successful competitor will not again put in an appearance, he may be able to offset the first award by the later and presumably more meritorious one.

So notorious have these things become that some of the best manufacturers of telegraphic and electrical apparatus, which formerly made no unimportant feature at these exhibitions, now decline to go to the trouble and expense of making a show at even the best of them, regarding the game as not worth the candle. The telegraphic and electrical department at these exhibitions ought to be the best and most attractive of any, but of late years, with one or two exceptions, such has not been the case.

The first reform which suggests itself in connection with this matter is that their number shall be reduced and their relative importance increased. The ancient but by no means declining exhibition of the American Institute should suffice for the Eastern States; the Cincinnati Exhibition for the West (it might, perhaps, be considered better to locate the Western exhibition somewhere else, but the enterprise and public spirit which have made the Cincinnati Exhibitions so successful would seem to indicate that as the best place at which to hold it); and a third somewhere in the South, should suffice for the whole country. Is it not evident that if the number were thus reduced their relative importance would be vastly augmented, and their awards become more valued and valuable? The endorsement of all three of any invention or device would be almost final and conclusive in determining its practical value. Another reason which tells very powerfully against the multiplication of these exhibitions is the additional expense they entail, and frequently upon persons and inventions which are both ill able to bear it. There is no doubt but that this consideration keeps many away from these exhibitions who, if their number were limited, would be glad to avail themselves of the advantages afforded for bring-

ing their inventions and manufactures prominently before the public.

Another reform which is of great importance, and which must be adopted, and that at no distant day if it is expected that any value shall continue to be accorded to their awards, is in the manner in which they are made. For instance, we will suppose that an invention of great importance, value and merit receives a favorable report diploma and medal at either the American Institute Fair in this city or at the other leading exhibitions this fall; this is very gratifying to the inventor and the proprietors of the invention, who have been to considerable trouble and expense to exhibit it, and demonstrate its value and superiority. They take the necessary steps to disseminate the information that they have met with the approval and endorsement of the managers, and that their invention is of public use and benefit, and the best of its kind. This is all very well so far as it goes. A year rolls round and the time comes for another exhibition. Again competition is invited for this specialty. The successful exhibitor of last year, perhaps, cannot afford the expense attending another exhibition, or, supposing as the award of the previous year has demonstrated the superiority of the invention, and knowing that no improvement has been made during the intervening time, concludes not to exhibit. What is the result? Perhaps his inferior competitor of the previous year, “running for luck,” puts in his inferior article or invention again. There is no competitor, and the premium is awarded to him as a matter of course. Then the inferior and superior inventions both stand on the same ground: both have received the highest award, and the value of the award for either is utterly destroyed.

It would seem to be the true policy to adopt that in offering premiums for articles or inventions which it is desired should be exhibited, that where an award has previously been made for a similar article or invention that another similar award shall not be made, unless the article or invention shall possess superiority or merit over that which has already received official recognition and endorsement.

The managers of these exhibitions will no doubt urge against this that it will tend to reduce the completeness and attractiveness of their exhibitions, as it will relieve exhibitors from the necessity of putting in an annual appearance in order to maintain their standing. That there is force in this argument cannot be denied, and yet upon the other hand it is believed to be true that the contrary course is not only discouraging many from participating in these exhibitions, but is gradually but surely bringing the public to consider their awards of no value, as indicating superiority, novelty or usefulness in that for which they are made. Certain it is that in any event those who have inventions of real value to exhibit will not continue year after year to incur the trouble and expense of making exhibitions merely to prevent another and inferior invention receiving endorsement. They are coming to consider it rather for their interest to keep away from such exhibitions altogether, and show to the public that the awards are of little value and reliability in determining merit or superiority.

Another thing which has detracted very much from the value of the awards at some of the exhibitions has been the suspicion that they are not always made with perfect fairness and impartiality. It has been charged that they are frequently obtained through improper influence and personal favoritism. Probably it will be found impossible to avoid such imputations altogether, however careful and circumspect the management may be. Every effort should be made, however, to do so as far as possible, and in the appointment of committees and juries seek to display perfect fairness and impartiality, and so constitute them as to leave them open to no reasonable imputation of being organized to determine in a pre-arranged manner in certain cases. It will, of course, be impossible to convince many who fail to obtain the prizes or endorsement they seek that they have been judged fairly, and in the bitterness of their disappointment they may be expected to indulge in assertions of partiality, and even of more culpable motives in the decision. If, however, the design is evident to disinterested persons that each article or invention shall be judged fairly, and the judges are wisely and properly constituted with a special regard for their fitness and qualification for their duty, such complaints and assertions would find but few to listen to and less to credit them.

These remarks are not made with reference to any particular exhibition, but are intended to be general in their application, and are believed to be applicable to all the leading Industrial Exhibitions which are given in various parts of the country. Neither is the writer a sufferer from any unfavorable action on the part of committees or judges at such exhibitions, as they have usually looked kindly upon the few inventions in which he was interested and which have been submitted to their judgment. Regarding these exhibitions as of great value and importance to the industrial and business interests of the country, it is desired that they shall be arranged, organized and managed so as to best-

subserve those interests. Careful observation and consideration has satisfied myself and others whose opinions upon the subject have been obtained, that to establish and maintain the character of these exhibitions as they should be established and maintained these reforms and improvements are absolutely essential, and with a view of bringing them more prominently to the notice of those who have such exhibitions in charge these views have been put into their present shape and are given to the public through the columns of THE TELEGRAPHER. If the suggestions are impracticable or their adoption inadvisable I should be pleased to hear the reasons therefor, and have no doubt that space will be afforded in this paper for a reasonable discussion of the subject, as the telegraphic interests are perhaps as deeply concerned in it as any other.

[From The Telegraphic Journal.]

On the New Contact Theory of the Galvanic Cell.*

By J. A. FLEMING, B. Sc., F. C. S.

(Continued from page 211.)

THE preceding quotations may be taken as affording the plainest notion of the new contact theory; and it will be seen that its fundamental propositions are briefly these:

- I. That two plates of different metals in one liquid are at the same potential when insulated and separated; *i. e.*, there is *no* difference of potential due to chemical affinity.
- II. In a cell series the gradual rise in potential, or the electro-motive force, is due only to the dissimilar metallic contacts.
- III. The chemical action in the battery is the result rather than the cause of the difference of potential, and is looked upon as an accompanying action rather than as the actual creator of the current—*it* having little or no share in the production of the difference of potential between the terminals.

These are, I venture to think, points not to be admitted as proved without further inquiry, and against which, as I shall hope to show, some grave if not insuperable objections may be urged, founded on other experimental evidence. The first question to be settled is, then, whether in a series of cells the *whole* of the difference of potential between the terminals is due to the contacts, as above stated, or whether *any* portion is due to the tendency towards chemical combination existing between the metals and the electrolytes; and, as a consequence, whether in a single cell the plates are at the same potential or at different potentials, owing to the difference of chemical action upon them. Now, I think this point will be sufficiently proved if we can establish by experiment—(1) that a battery of cells can be constructed without any dissimilar metallic contacts, and with terminal plates of the same metal, and which shall yet exhibit difference of potential and continuous current; for if this is possible it must follow that chemical affinity *alone* is capable of *creating* electro-motive force as well as of maintaining a current, and that, in an ordinary cell-series, *some* part at least of the electro-motive force is due to this cause, whilst the remainder is the result of the metallic contacts that may exist. Or (2), if we can establish that the two plates in one cell are not at the same potential, as stated by more than one authority.

With regard to the first point, it will be remembered that an old experiment of Faraday's proved that a current can be maintained and decomposition effected by a single cell where there is no dissimilar contact. It is not easy to see how this experiment can be explained by any form of contact theory; indeed, it appears unanswerable. But, in order to leave no point unsettled by experiment, it seemed desirable to try and arrange a series of cells in which all dissimilar contact was absent, so that the difference of potential due to chemical action might be separated from that due to the contacts and rendered visible by the electro-scope. It is obvious that we can make no attempt to do this unless we can in some way or other obtain a battery with terminals of the same metals; for otherwise the very junctions with the electro-scope introduce what we want to eliminate, *viz.*, dissimilar metallic contact. But the following is a method by which this can be accomplished: If plates of lead and copper be placed in nitric acid the lead is positive to the copper, since it is most acted upon; but if lead and copper be placed in solutions of alkaline per sulphides, then the copper is most readily acted upon, and is positive to the lead—that is, the positions are reversed.

Now, if we place in a cell dilute nitric acid and a copper and a lead plate, we cannot join up another cell of the same sort in series without introducing contact. But if, instead of using a cell containing acid, we take another cell containing sodic pentasulphide, and bend over the lead plate of the first cell to dip into the liquid in the second cell, and place

* Read before the Physical Society, March 21st, 1874.

therein also a copper plate, we shall then have two cells joined up in series without dissimilar contact and with similar metals for terminals; and yet the action of the liquids on the metals is such that in the one the lead is positive to the copper, and in the other the copper is positive to the lead. Hence, there is a regular rise in potential in passing through the two cells, and on joining the terminals by a copper wire a current flows through both cells in the same direction. It is obvious that we need not limit ourselves to two cells. By forming a pile of alternate cells filled with acid and alkaline persulphide, connected by bent copper and lead plates alternately, we shall be able to accumulate difference of potential to any extent; and if the number of acid and alkaline cells be equal, we shall always end with a plate similar to that with which we began. Such a battery will exhibit a difference of potential between its two terminals when the circuit is opened, and will give a current when it is closed. In it we have nothing but chemical action to rely upon, both for creating electro-motive force and for maintaining the current. We have no dissimilar contacts; and as the terminal plates are similar we can effect the junctions with the electroscope without introducing an unbalanced dissimilar contact. I have constructed such a battery of sixty cells; and by the kindness of Professor Guthrie, to whom my thanks are due, I have been permitted to compare its potential with that of a Daniell cell, by means of a quadrant electrometer belonging to his laboratory. By this means it is at once seen that the difference of potential increases proportionally to the number of cells, the electro-motive force of four cells being about equal to that of one Daniell. Joined up with a galvanometer it indicates a current, which, however, rapidly falls off in strength, owing to the formation of an insoluble cupric sulphide upon the copper plates. Joined up in opposition to a single Daniell cell, with a galvanometer included in the circuit, I find that it requires from four to five cells to balance the force of the Daniell at first immersion; but after leaving it to work on short circuit for two and a half hours its electro-motive force had fallen off 50 per cent.; it then required about eight cells to bring the needle to zero. This gives for the electro-motive force of two cells at first about 0.5 of a volt; or the whole sixty cells are equal nearly to fifteen Daniell's cells. It readily effects the decomposition of many electrolytes, and exhibits, therefore, every property of an ordinary cell-series. Above all, it will be noticed that since there is a regular rise in potential in passing from cell to cell, and as all parts of each plate must be at the same potential, that rise can only take place at the surfaces where the active metals are in contact with the electrolyte (that is, at the seat of the chemical action), and that, therefore, two metals in one electrolyte *cannot* be at exactly the same potential. But I find that more direct evidence still of this fact is to be found in an experiment of Faraday's, which seems to have escaped the notice of the contact theorists.

In his "Experimental Researches" he gives the following fact: "I took a voltaic apparatus, consisting of a single pair of large plates, namely, a cylinder of amalgamated zinc and a double cylinder of copper. These were put into a jar containing dilute sulphuric acid, and could at pleasure be placed in metallic communication by a copper wire connecting the two plates. Being thus arranged, there was no chemical action whilst the plates were not connected; on *making* the contact a spark was obtained. In this case it is evident that the first spark must have occurred before metallic contact was made, for it passed through an interval of air; and also that it must have tended to pass before the electrolytic action began, for the latter could not take place until the current passed, and the current could not pass before the spark appeared. Hence," he says, "I think there is sufficient proof that the zinc and water were in a state of powerful *tension* previous to the actual contact." It is difficult to reconcile this with the experiment of the half discs and drop of water made by Sir W. Thomson. But, at any rate, a consideration of the whole of the facts would seem to point out that the only safe conclusion is, that in any series of cells, of any sort, the electro-motive force is a complex effect, being due to the algebraical sum of all the differences of potential due to dissimilar contacts *plus* the algebraical sum of the differences of potential due to the chemical affinities of the metals and the electrolytes *minus* any opposing force due to polarization, etc.; and that, so far from being the exclusive cause, the contacts can only be said strictly to have a share in producing the difference of potentials between the extremities of a battery. And, lastly, we may with advantage compare the statements of the contact theory with certain other well ascertained facts. Such statements, for instance, as these: "If we close the circuit by connecting the metals by a wire, we then have constant separation of electricities at the point of contact or different metals, and constant recombination attended with decomposition through the electrolyte." "The electricities separated at the metallic junctions recombine through the water," "whilst the current flows the water is decomposed," which seem based on the assumption

that the principal seat of the electrical actions is *not* to be looked for at the seat of the chemical actions. But, now, how does this fit in with those cases of electro-chemical inversions noticed by De la Rive, where the direction of the current in a cell is *reversed* by simply diluting the electrolyte? Thus zinc is negative to tin in strong nitric acid, and mercury negative to lead; but in weak nitric acid the positions are reversed. Hence, if couples be formed of these metals in strong nitric acid, and the acid be gradually diluted, the current first ceases, and then is reversed in direction.

Here, without altering the metallic junctions, we can at pleasure alter the direction of the current, and, therefore, also, the direction of the fall in potential, since the current must flow from high to low potential. This seems conclusive that the chemical electro-motive force must be even greater than the contact electro-motive force. This reversal of the current, by changing the seat of the chemical activity, may be shown in another way, depending on the application of a very old principle. If plates of copper and clean iron be connected by copper wires with a galvanometer and the iron rendered passive by immersion for a moment in strong nitric acid, then if these plates are plunged into dilute nitric acid the galvanometer indicates a strong current going through the cell from the copper to the iron. If they be removed for an instant, and the iron plate touched, on again immersing the current is found to be reversed. Or, we may again change the conditions, and notice that it is not sufficient to have merely two different metals and an electrolyte to form a cell. If plates of pure gold and platinum be placed in nitric acid the most delicate galvanometer detects no current, and the same for many other pairs of metals and electrolytes.

Here we have contact of different metals producing its difference of potential; yet no current flows round "decomposing the electrolyte," as, according to the contact theory, it should do; but the instant we give play to chemical combination the ordinary results ensue. If the extremities of the copper wires from a galvanometer be attached to iron plates, and these plunged into separate cups of dilute nitric acid, on making connection between the two cups—by a bent iron plate dipping into each—no current is detected. On making one limb of the connecting plate passive and reimmersing, a strong current is visible; and we find that we have the direction of the current completely under command by making any of the four plates more or less acted on than the other three.

If these experiments are to have any importance attached to them it can scarcely be doubted that they land us in conclusions similar to the others, namely, that we must look for the principal source of the electrical disturbances at that place where the greatest chemical activity is being brought into play; and that whereas contact of metals is in itself productive of definite electrical separation, there is in the battery another cause assisting in the production of difference of electrical potential between the terminals, namely, the potential chemical combination between the metals and electrolytes existing when the circuit is open—the energy of the current produced when the circuit is closed being, of course, the equivalent of this potential energy which disappears.

The Canadian Marine Telegraphs Bill.

At the last session of the Parliament of the Dominion of Canada a bill was passed "to regulate the construction and maintenance of marine electric telegraphs." This bill was intended to terminate the exclusive concession of the right to land telegraph cables on the coast of Newfoundland held by the Anglo-American Telegraph Company, and under which its cables are now maintained. The following article, which is condensed from the *Railway News*, of London, England, furnishes a statement of the present condition of this bill, which has not yet received, as it must before going into effect, the royal assent. The London newspapers have for some time past been engaged in an active discussion of this bill, which, as will be seen, is a most important one, as affecting the status of the Anglo-American and the Direct United States Cable Companies. The *Daily News* and *Standard*, of London, are urgently advocating the bill, in order that the monopoly of telegraphic communication with Newfoundland, now held by the Anglo-American Company may be abolished, and the *London Times* opposes it.

As the cable of the Direct United States Cable Company is now nearly completed, the subject is one of great importance, as until the royal assent is given to it the cable cannot be landed on the Newfoundland coast, but must be worked in one circuit from Ireland to Torbay, Nova Scotia. For the present, at least, the cable will be spliced off the coast of Newfoundland.

The *Railway News* says: "It was well known that the bill was prepared upon the instructions of Mr. Lawrence Oliphant, the agent of the Direct Cable

Company, and was passed mainly through his earnest and persevering efforts with the members of the Dominion Parliament. The bill consists of seventeen clauses, and fifteen of these are ordinary general provisions, mainly for protection of the public local rights and to prevent interference with navigation. The first section declares that the act shall apply:—1. To all companies hereafter authorized by act of the Parliament of Canada to construct or maintain telegraphic wires or cables in or across any tidal water within the jurisdiction of Canada. 2. To all companies already authorized to construct or maintain such telegraphs by any act of the Parliament of Canada, or any act or charter of any province of the Dominion now in force.

"Passing over the general provisions above referred to, we come to the 14th clause, which enacts that no company other than those mentioned in the first section, or which become incorporated in Canada under the 15th section, shall construct, maintain, or use any telegraphic wire connecting two or more provinces of the Dominion, or extending beyond the limits of any province in or across any tidal water within the jurisdiction of Canada. And then follows a proviso that 'nothing in this section contained shall be construed to prohibit any existing telegraph company, or association from continuing to receive and transmit messages over its line of marine telegraph until such time as another company, under the authority, and within the provisions of this act, has constructed and is operating a line of marine telegraph which has been determined by the governor in council to afford reasonable facilities for the transmission of marine telegraphic messages in lieu of the line or lines of such existing telegraph company or association, or to be a line for doing business over a route of a competitive nature.'

"The 15th section provides that in case any company is now or shall hereafter be incorporated by or under any act of the Imperial Parliament or royal charter for establishing or maintaining telegraphic communication in or across any tidal water within the jurisdiction of Canada, the Governor and Council may by letters patent grant a Canadian charter to such company with the same powers and conditions as if incorporated by special act of Parliament, 'but no such letters patent or grant of corporate powers to be exercised within the jurisdiction of Canada shall be made to or conferred upon any company or association which possesses any exclusive privileges of landing wire or cable for a marine telegraph in or upon the coast of any State, province, or country in America, Europe, or elsewhere, unless an equal or reciprocal right or privilege of landing wire or cable and establishing a marine telegraph upon the same coast is conceded to any and each of the companies in the first section of the act mentioned, or which may become incorporated in Canada under the provisions of this section of this act, so that any company incorporated or to be incorporated in Canada may enjoy the same advantages in maintaining its marine telegraph line in and upon the same coast as the said company which may possess such exclusive privilege.'

The radical objection to this legislation is, *The Railway News* says, that it is retrospective in its action. The "act wholly alters the conditions upon which property worth several millions sterling has been for many years held and worked, the alterations being made, not with the sanction of the proprietors, or even after notice given to them, but carried with a high hand in their absence, against their wishes and against their just rights.

"The *Standard* and *Daily News* would make it appear as if the bill applied only to lines of cable to be laid hereafter, and ignores altogether the fact that it would prohibit the working and using of lines, some of which (as those between St. Pierre and Nova Scotia, and between Newfoundland and Cape Breton) have been in existence and used for the last twenty years.

"Retrospective legislation is abhorrent to English principles, and when its effect would be to confiscate a valuable property, by means of which local and imperial interests have for many years been served with unvarying fidelity and with marvellous skill and success, there can be no shadow of justification for the act.

"The Anglo-American Company has, with and by its partners, the New York, Newfoundland and London Telegraph Company, been working for the last twenty years to establish and perfect a system of Atlantic telegraphs, and for the first twelve or thirteen years derived no return whatever for their labor and enormous outlay, and, as all the world knows, ran the greatest risk of total failure and loss. Before attempting to raise the capital for an Atlantic cable the promoters very prudently sought and obtained from the Legislature of Newfoundland an act which gave them the exclusive right for fifty years of landing telegraph cables on the island. This right the Government of Newfoundland can now, under the terms of the act, redeem by paying for the cables and telegraph property of the company in Newfoundland the value put upon them by arbitration.

The Anglo-American Company is now, by amalgamation and purchase, the sole owners of all the local cables and of the Atlantic lines, including those of the French Atlantic Telegraph Company. They represent a total capital of £7,000,000 sterling, and it is stated, we believe with truth, that they could not be replaced for a less sum. The company is, however, an English, not a Canadian company, and, therefore, does not fall within the description of companies entitled to the exceptional benefits of the Canadian bill, but, on the contrary, the bill subjects to forfeiture all the cables which the Anglo-American Company now holds on the shores of the Dominion so soon as the Direct United Company have successfully laid their line.

"The bill was brought in as a public measure near the end of the session, without notice to the parties intended to be chiefly affected by it, and the promoters doubtless hoped they would get it through without observation. They succeeded in passing it through the Lower House unopposed and without discussion, and it was not until it reached the Senate that the Anglo-American Company received any intimation that such a bill had been introduced. We are informed that only four or five days elapsed between the receipt in London of the first telegraphic message on the subject and the day when the bill was finally passed by the Senate. The Anglo-American Company, therefore, could not possibly present any petition against it, or lay its case before the committee. We believe that they tried by telegraph to get a clause inserted saving their rights, but were defeated by seven votes, in a House of fifty-five. A copy of the bill was received in London about ten days after it was passed. The Governor-General very properly referred to the Home Government the responsibility of giving or withholding the royal assent to the act.

"The effect of the act, if carried to its legitimate conclusion, would appear to be that the Anglo-American Company should remove all its cables from the Dominion shores and carry the whole of its traffic by St. Pierre and Duxbury, or direct from Newfoundland to the United States. Canada would then be left for its European communications to the solitary wire of the Direct Cable Company, which we hope may be safely laid this year.

"The pretence on which the bill is founded is the doing away with monopolies, but with admirable inconsistency the sixteen:th clause expressly saves the exclusive rights of any company heretofore incorporated by special Act of the Parliament of Canada. This clause applies, and was of course meant to apply, only to the Canadian and Great Northern Telegraph Company, the skeleton of a scheme for laying a line from the North of Europe, by Greenland and Labrador, to Canada. The Great Northern Telegraph Company, which we suppose is to be connected with this line, holds half-a-dozen exclusive telegraph concessions from Russia, Norway, Denmark and Sweden, but they do not interfere with Mr. Oliphant's so-called direct cable. The faint outcry recently got up against telegraph monopolies is little less than absurd. Mr. Emerson, the Speaker of the Newfoundland Assembly, in his able letters to the *Times*, has more than justified what that province did in 1854, but those who have seen how the submarine telegraph system has been formed and extended know perfectly well that not one tenth of the existing mileage of cables would ever have been laid but for the protection thus given to the shareholders. Whilst the man who invents a new nutcracker or corkscrew, or a new method of transmitting signals through a telegraph line can get a patent protecting him against all the world for fourteen years certain, and the editors of a new Wesleyan hymn book are entitled to copyright which no man may infringe, it seems unreasonable to cavil at the monopoly held by the Anglo-American Company in the little colony of Newfoundland, upon the faith of which such vast sums have been laid out, and which the Newfoundland Government may put an end to at any moment if they choose to pay the agreed price for it. There is no precedent in English or Canadian legislation for this bill, and we warn Canadians that if it is put in force they will find that they have done the financial interests of their country far more damage than would be repaid if the direct cable were to carry Canadian messages free for the whole term of its existence.

"The present bill should be disallowed, and a new bill be brought in next session, when the whole question can be fully discussed and the rights of all parties fairly considered. The legislation which is to protect the Dominion from telegraphic monopolies can then be made to apply with full effect, and without sacrificing existing interests."

REUTER'S TELEGRAM COMPANY (LIMITED) have announced that on and after the 1st September they will undertake the transmission of telegrams of one word and upwards at reduced rates to the United States and Canada.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Suggestions for "Old Probabilities."

NEW YORK, Sept. 16.

TO THE EDITOR OF THE TELEGRAPHER.

THOSE who have noticed the weather reports of "Old Probabilities" for the last few days have no doubt observed that they have been erroneous almost every day, especially as far as this locality is concerned. To-day's "Probability" reads "Over the Middle Atlantic States winds shifting to northerly, with rising barometer; lower temperature and clearing weather." At this writing, eleven o'clock A. M., the wind is due east, and it has rained continually since six o'clock this morning, which, to my mind, constitutes a perfect failure in the prediction.

It seems evident to me that "Old Probability" is too general in the wording of his reports and predictions. He frequently groups together the New England and Middle States, with variable winds and local rains. This extent of territory is sufficient to embrace almost every variety of weather to which we are subject, and under such a prediction the claim for great accuracy would hold good. Even taking the Eastern or Middle States the term "local rains" is too indefinite, and under such a prediction a single shower in any part of these States makes the prediction good, and, I suppose, the Bureau would record it as a success, whereas to the great majority it would really be a failure.

To my mind the country should be divided into districts of not to exceed 100 miles square, with the most important seaport or place in its centre, and the prediction made with particular reference to that centre, and let the surrounding country judge of its local weather by its proximity to that place. The reports would then read something as follows:

"New York City, rising barometer, lower temperature, westerly winds, and clear weather."

This would be a clear and definite prediction, which in a short time would settle the question as to whether "Old Probability" gives a *quid pro quo* for the large amount he costs us.

I may refer to this subject again should it be deemed a subject proper for discussion in your columns.

WEATHERCOCK.

The Inter-State Exposition.—Telegraphic News and Notions.—Experience with a Telegraph Student.—A New Telegraph Line Talked of, etc., etc.

CHICAGO, ILL., Sept. 14.

TO THE EDITOR OF THE TELEGRAPHER.

CHICAGO is all ablaze again, not with a destructive fire this time but with the Inter-State Exposition. Everybody is flocking to see it, and "it" in this case means a great deal. I cannot as yet attempt a description fitting for your columns, as I have not thoroughly investigated it, or as some have it, "done the Exposition yet as a whole." Nearly all the makers of telegraph machinery who were represented last year are on hand again this year. I will attempt a description more fully in my next.

As will be seen by your personal column, quite a number of the operators of this city have been enjoying a short vacation; among them some of the W. U. managers, all of those so fortunate, except the latter, being obliged to furnish substitutes. Some of those taking vacations have been called to do so on account of sickness and death in their respective families. They have the sympathy of all their fellow laborers here in their afflictions. Those who have had a vacation of pleasure and rest have not been begrudged their recreation by their less fortunate associates, notwithstanding many of those unable to take vacations needed the rest and relaxation. "Did you have a nice time?" "Did you get some good butter to eat?" "Was there any water in the milk out there?" "Well, I'm glad to see you back again." These are some of the questions daily and nightly asked these hero and heroine "brass pounders" when enough of them get clear to form a "sauce" around some unoccupied table.

The damage done by the last fire we had here was soon repaired. The interruption of the working of the wires on the streets in that vicinity was so brief that I did not think it worth while to crowd your columns with a recital of the details at that time. Both the W. U. and the A. and P. Companies lost heavily, however.

The W. U. Company only last spring took down the Mullen stock poles on State street and on Third and Fourth avenues, and substituted therefor some very

fine fifty-five feet poles. In fact the Western Union last spring gave all the routes from this city a thorough overhauling. Their genial master of repairs, Mr. Hopkins, with his efficient force of linemen, doing some of the nicest work that it has been my pleasure to see for some time. Fifty-five foot poles were set along both the southern and western routes on North Clark street, leaning poles were straightened and decayed ones and those rendered unsafe on account of being made to do duty as hitching posts as well as bearers of the iron chord of civilization (that's original) and the victims to the molars of the fiery and untamed steed, were supplanted by fine forty and fifty feet poles, the latter being used nearest the main office. Previous to the great fire here all the wires of the Western Union Company in this city were strung on "Brooks' insulators," and I am informed by one in authority, who ought to know whereof he affirms, that the wires have never tested so satisfactorily since, from the fact that on repairs recently in the city the "Brooks" have not been used, for what reason I am unable to state. The Kenosha insulators have been used recently on repairs here in the city. An intelligent line repairer of my acquaintance, who has given insulation a good deal of thought, says the Brooks is the best insulator made, that although the first cost is much more than any other insulator its insulating properties are so vastly superior to any other he has used in his fifteen years' experience in line building and repairing, that they are by far the cheapest insulator in the market. He makes one serious objection to them however, which Mr. Brooks might remedy. The objection is that the way they are now constructed lightning bursts up through them, destroying their insulating properties of course, and it passes through the insulator in such a manner that the defect cannot be noticed by a repairer unless he climbs each pole and examines each insulator. Not being an insulation man I do not suggest a remedy, but give the information for what it is worth. Several of the Burlington and Quincy and some of the Michigan Central Railroad wires are strung exclusively on Brooks' screw shank insulators, and give great satisfaction, working well in either wet or dry weather.

It is currently reported here that Mr. Donald A. Smith is to be provisional president of the Central Canadian Telegraph Company for constructing or operating a transcontinental line from Canada to the British North American possessions. I have not as yet heard the route of the proposed line. I suppose it will be worked in connection with the Canadian Pacific Railway Company's lines. I believe negotiations for the building of the road and line are now pending at the seat of Government of the North American possessions, as well as at Montreal, Canada. As this is but a rumor in telegraph circles here, I give it to you for what it is worth.

I find that it is a prevailing idea among outsiders that the monopoly, as the Western Union is generally termed, had things their own way with the railroad companies in regard to the use of wires, etc. I was myself of the same opinion until quite recently, when one of the boys who used to work the overland wire in those happy days when San Francisco was worked direct, gave me a bit of his experience as to how he got stuck all night by the man in charge of a certain Western railroad terminus office. It seems the regular boss despatcher was the circuit manager, he arranging the wires before leaving the office for the night in such manner as, in his judgment, would provide facilities for all parties, and giving orders that the wires were to remain in that shape. During the night a heavy storm came up just as San Francisco was almost clear, and, although one of the chiefs, who thoroughly knew the route, suggested how some cross connecting and opening of bad wires could be done to allow "St." to clear, he was told it could not be done, as it was against orders to change the wires there, and the wires were not changed until morning, either. As several similar aggravations came to the same party's notice it looks as if he hold on the Western roads by the monopoly is not so firm as some suppose. However, this might be remedied by the proper officials if they were cognizant of the facts; but as it only "stuck" the all night men and held a few messages, probably it was not brought to their notice. These are some of the things "no fellow can find out."

I want to give you the following incident to show you the importance fledglings in the business attach to their being left in charge of an office. The youth in question was one of those fellows who know it all. It became necessary to hire some extra men from the day force, one evening, and one old reliable very reluctantly gave up the expected pleasure of an evening out, and sat down to a way wire to make the best of the situation. The fellow he tackled first, and one that lasted him nearly an hour, was a way office not a hundred miles from here, and one that generally sent but one message in the evening, which was a "red" and a "cipher" message. The manager was away, and the "yndie," i. e. student, was in charge. After listening for a few moments to something which "Old Reliable" thought sounded

(Continued on page 227.)

Mr. J. E. HOCKETT, formerly of Chillicothe, Ohio, has accepted a situation in the Cincinnati, Ohio, Western Union office.

Mr. O. C. BOSTWICK has been transferred from Christmans, Ind., night office, to Calumet, Ill., night office, Mich. Central Railway, vice Mr. RACE, gone home on sick leave.

Mr. WILLIE ABBOTT has been appointed night operator at Christmans, Ind., M. C. Railway, vice Mr. O. C. BOSTWICK, transferred.

Mr. S. H. BELCHER, night operator at Albin, Mich., M. C. Railway, has resigned and gone West. May success attend him is the wish of his late associates.

The Telegraph.

By Cable.

LAYING THE DIRECT ATLANTIC CABLE.—THE WORK PROGRESSING SUCCESSFULLY.

LONDON, Sept. 10.—A despatch from the steamship Faraday, which is engaged in laying the direct cable to the United States, dated the 8th inst., at noon, reports that she was then in latitude 50° 43', longitude 20° 32'.

Four hundred and fifty three miles of the cable had been paid out.

A later despatch from the Faraday, under date of ten o'clock A. M. yesterday, states that the work of shifting the paying out of the cable from the fore to the after tank had been successfully accomplished, and all was progressing well.

Competition in Marine News.

THERE is likely to be an active competition in the collection and distribution of marine news in this and other cities by telegraph as a consequence of the difficulty between the Merchants' Exchange and Newsroom and the Western Union Telegraph Company, and the construction of the new competing line to Sandy Hook, of which an account was given in the last issue of THE TELEGRAPHER. The Gold and Stock Telegraph Company have issued a circular to the "underwriters, shipowners and those interested in marine news," announcing that they will immediately add to their business in New York and other principal cities a department for the collection and distribution of marine and other news interesting to shipowners, underwriters and commercial men generally. A news room is also being fitted up in the basement of the Cotton Exchange, at the corner of Hanover and Pearl streets, in connection with an office of the Western Union Telegraph Company, and all important marine news, will be posted on the bulletin boards of the news room as soon as received, and will be furnished to customers at their residences and places of business by the printing telegraph instruments of the Gold and Stock Telegraph Company.

Under the stimulus of this competition there is no doubt but that the business of marine news reporting will be carried on more satisfactorily than it has been done before. The contest promises to be a very bitter and protracted one, and will undoubtedly prove beneficial to those who are interested in this class of news, even if it should not be remunerative to the contestants.

The Dominion Telegraph Company of Canada.

THE Dominion Telegraph Company of Canada is making an important extension of its lines and facilities this season. That company is adding about 600 miles of poles and 1,000 miles of wire to its lines already in operation. The new lines are expected to be completed before winter sets in.

Astoria Telegraph Line.

ARTICLES of incorporation of the Portland and Astoria Telegraph Company have been filed at the County Clerk's office by John West, George Flavel and Wm. Wadhams. The object of the company is to construct, maintain and operate a telegraph line from a point at or near Cowlitz Station, W. T., to Astoria and intermediate points along the Columbia river and elsewhere. The principal office of the company will be in Portland. The capital stock is put at \$15,000, in shares of \$50 each. A telegraph line could be taken overland at a considerably less cost, but the incorporators are satisfied that they can more readily dispose of \$15,000 worth of stock on the river route than they could \$8,000 worth by land. The Western Union Company will give the use of their line from this city to Cowlitz on reasonable terms, and this company will probably be entrusted with the placing of the wire from Cowlitz to Astoria. The promoters have received every encouragement in the scheme. They will have stations at the different fisheries and other points along the river, and

it will be their aim to so conduct their line that it shall be of the greatest possible advantage to the public. The work of construction will be commenced at the earliest practicable moment.—*Albany (Oregon) Daily Bulletin.*

Telegraphic and Electrical Brevities.

THE annual meeting of the Western Union Telegraph Company will be held at the office of the company, in this city, on Wednesday, October 14th, at noon. The Transfer Books will close on the afternoon of the 19th inst. and be opened on the morning of the 16th October. The quarterly dividend of two per cent. will be payable at the office of the treasurer on and after October 15th.

The annual meeting of the Gold and Stock Telegraph Company will be held at the office of the company, 61 Broadway, on Tuesday next, the 22d inst.

At the meeting on the 19th of August of the Mediterranean Extension Telegraph Company, Limited, a dividend at the rate of 3 per cent. per annum on the Ordinary shares, as well as the usual dividend on the Eight Per Cent. Preference Stock, was declared, leaving \$500 to be carried to the reserve fund.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

SEPT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
10	78% 79%	16 1/2 16 1/2	.....
11	78% 79%	16 1/2 16 1/2	.....
12	78% 79%	.....	.....
14	79% 80%	.....	.....
15	79% 80%	.....	.....
16	79% 79%	.....	.....

Married.

PURDON—CLINE.—At Albany, Oregon, Tuesday evening, September 1st, 1874, at the residence of E. B. Purdon, Esq., Mr. Jos. S. PURDON, Manager Western Union Telegraph Office, Albany, to Miss JENNIE CLINE.

Joseph—I am rejoiced to see that Miss Cline and you are inclined to follow the noble example of so many G. & C. boys in getting married. Please do not de-cline my congratulations and best wishes for a protracted life of peace and prosperity and hope that you may glide smoothly down the de-clining years of the unknown future. W. H. FLOOR.

YORK—BALTHIS.—At Chicago, September 10th, 1874, GEORGE C. YORK, Esq., Assistant Manager Western Union Telegraph Office, Chicago, Ill., to Miss ANNE D. BALTHIS, of the same city.

Mr. York is one of the few men who know how to make his subordinates all love him, and at the same time command their respect and cheerful obedience to all his orders. The Chicago operators join with his many friends all over the country in wishing him and his estimable wife a happy journey over life's troubled sea and a blissful entrance to the haven of rest, where there are no "interruptions" to the "current" of eternal happiness. *

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COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Western Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
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Each additional word 1c. Each add. word, 2 to 3 cents.
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CLEAR AND TRANSPARENT.

Your name beautifully printed in Gold on One Dozen for 50c.; post paid, three dozen, \$1.

Must have Agents everywhere.

Outfits, 25c.; Samples, 3c.

F. K. SMITH,
BANGOR, MAINE.

ANDERS' MAGNETO PRINTING TELEGRAPH INSTRUMENTS.

These instruments require

NO ACIDS OR CHEMICAL BATTERY.

the currents required to operate them being generated from PERMANENT MAGNETS.

They print very rapidly, and having been fully tested on private lines during the last eighteen months, have proved to be

VERY RELIABLE.

The following parties, among others, have purchased them after giving them

THOROUGH TRIALS

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- THE BOYNTON PACKING COMPANY, Boston, Mass.
- CHAS. HULBERT, Esq., 8 Exchange Place, Boston, Mass.
- THE BOSTON AND ALBANY RAILROAD CO., Boston, Mass.
- MESSERS. J. H. CHADWICK & CO., Boston, Mass.
- JAMES ALEXANDER, Esq., Agent Guard Steamship Company, Boston, Mass.
- CHAS. S. LOVERING, Esq., Treasurer of Whittenton Mills, Taunton, Mass.
- HON. ISAAC BRADFORD, Mayor of Cambridge, Mass.
- GEO. H. COPELAND, Esq., Chief of Police for the Cambridge Police Telegraph, Cambridge, Mass.

We also continue to manufacture

ANDERS' MAGNETO DIAL TELEGRAPH INSTRUMENTS,

which have been extensively used for several years, and are recommended as the

BEST DIAL INSTRUMENTS MADE.

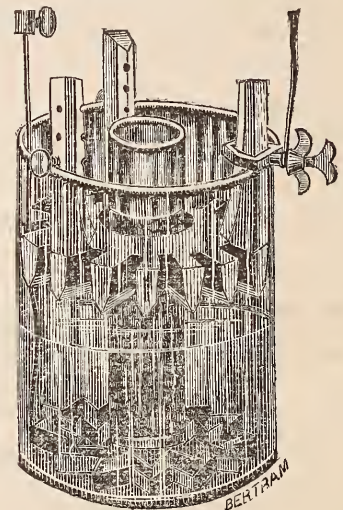
Parties who purchase either our PRINTING OR DIAL INSTRUMENTS can exchange one for the other at any time, as both the Printers and Dials are used with the same transmitters.

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Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished (Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

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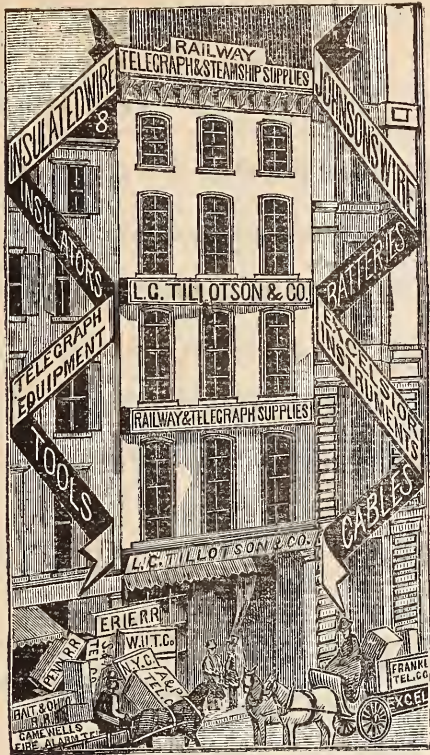
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FOR A
TELEGRAPH LINE,
ORDER OF
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They have the **GREATEST VARIETY.**

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EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE
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TELEGRAPH INSTRUMENT FOR STUDENTS,
Comprising Sounder and Key, is the greatest
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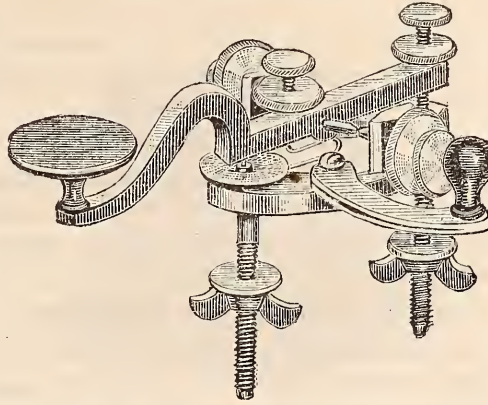
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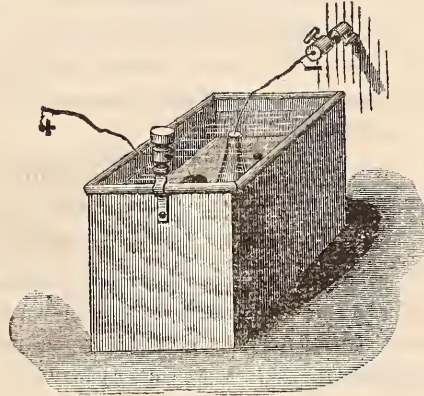
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
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SUPERIOR INSTRUMENTS AND BATTERIES,
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Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and **Labor at last Secured.**

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the
EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.
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TELEGRAPH INSTRUMENTS,
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RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and KEY on same base, making an elegant set.

WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
WESTERN UNION (new style) SWITCH BOARDS.
ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

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WITH A CENTRAL OFFICE,
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OF
FIRE ALARM TELEGRAPH
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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM
AND
POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

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FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the **People, Municipal Authorities,** AND THE **PRESS** throughout the **UNITED STATES and CANADA.**

NO EFFORT, TROUBLE OR EXPENSE is spared by the Proprietors to obtain and secure **ANY POSSIBLE IMPROVEMENT** which shall increase the **EFFICIENCY, RELIABILITY and ECONOMY**

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The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the **UNITED STATES and the DOMINION of CANADA,**

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These Instruments are now made in two different styles, a \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

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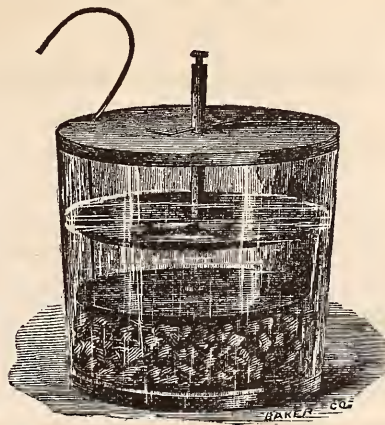
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A REVISE AND ENLARGEMENT OF THE
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TAL. P. SHAFFNER, LL. D.,

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The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

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Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

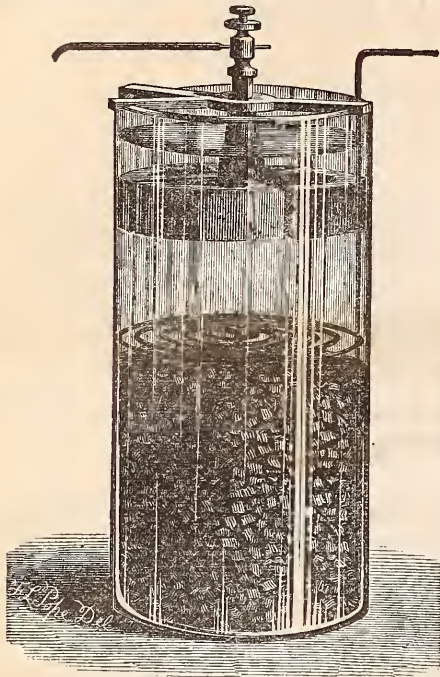
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

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This Battery received the FIRST PREMIUM over all competitors for

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without any ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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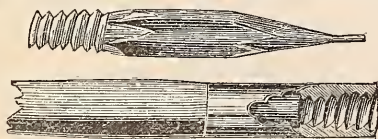
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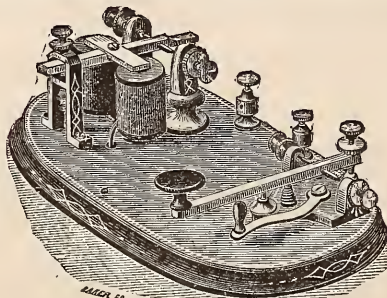
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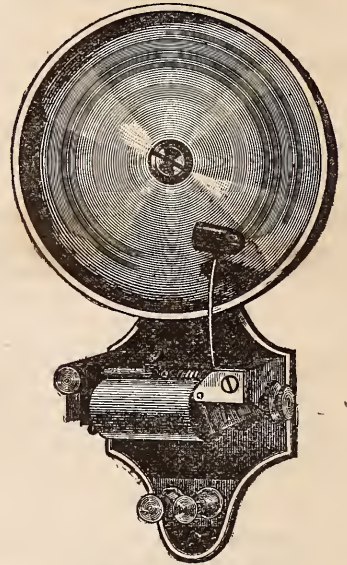
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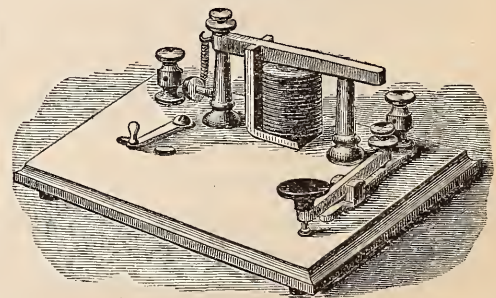
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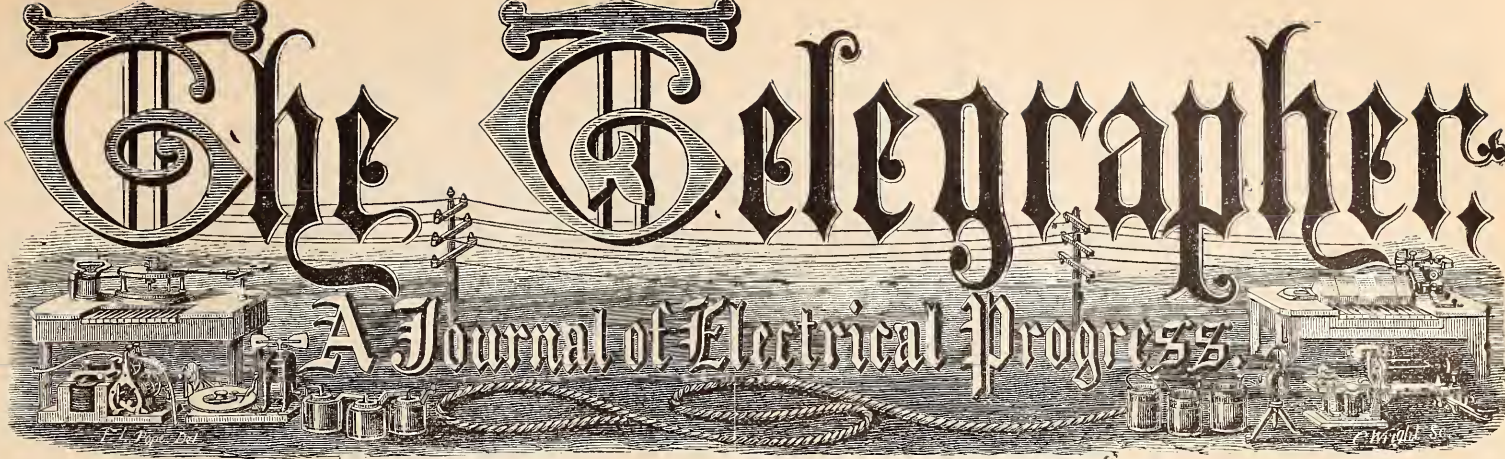
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The Telegrapher.

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, September 26, 1874.

Whole No. 428

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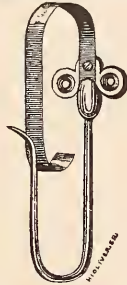
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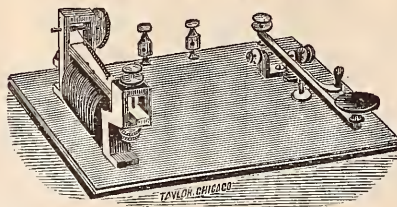
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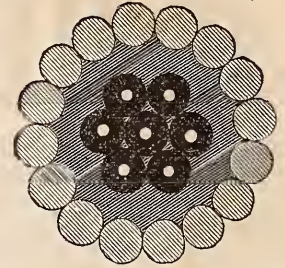
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, SEPTEMBER 26, 1874.

VOL. X.

WHOLE No. 428.

Original Articles.

Thrown Overboard like Jonah.

BY JOHN OAKUM.

Subscribers please note change in address of the Operator.

— of Sept. 15th.

SINCE the world began it has been a mystery which the human brain has found it impossible to solve that the men whose minds are developed to a degree of grandest sublimity are found impracticable for the uses to which we are expected to lend our abilities in this sordid, selfish world. When we contemplate the long list of names, and consult the varied and pathetic history of men to whom civilization in its present advanced stage would bend the knee in silent homage, and whose memory it is proud to cherish; when we think of these men, I say, and reflect how inadequate was the meed of credit yielded them in their own time, how cold and ill seeming the paltry applause that an unsympathetic and half cultivated generation grudgingly bestowed. The heart wearies at the ingratitude of mankind, and the frosty and hypocritical return for what has been freely given. Not until the sweet singer of Avon had played his part in life's drama, and his dust had gained sepulture in the homely little church whose modest spire towers amid the gentle landscape of Stratford were the grand tragedies given to the reading world which more cultivated ages have perused with reverence and awe. The wondrous melody of Chopin lay hushed and silent in the great composer's grave while the grass of many seasons was growing above the dead, and moss was forming on the gray old shaft which marked his resting place. But an ever advancing world has discovered his music, and fell to worshipping it as something long lost but destined to be immortal. I might multiply examples in support of my original proposition, but it seems unnecessary. Let me illustrate from the events of the present day.

A few months ago there came under my observation an enterprise which seemed to lack an experienced and able guide to place it on the road to prosperity and success. Its founders were inexperienced, and the spokesman proved himself a painstaking, hard working and conscientious man, who recognized what was needed, and sought a proper person to fill the niche. There were several who were tolerably available, but no one preëminently fitted for the work, until a flash of Fate's flickering torch revealed "a gem of purest ray serene"—in 1850th he so asserted himself. "Full many a rose is born to blush unseen," but this rare exotic who, up to the time in question, had wasted his sweetness on the desert air of by-places, and whose name had never been sullied by being known outside of the offices in which he worked, began to exhale a fragrance intoxicating to the senses and bewildering to the reason. The bounding swell of Byron, the sweet mellifluous flow of Moore, the simple winning grace of Goldsmith, as expressed in their poetry, paled beside the metrical marvel of this sad, sweet singer whose efforts in the realms poetic combined all the beauties of what had gone before, and anticipated all that could be hoped for from bards unborn. And his rhyme was scarcely to be compared with his prose. Blend the elegance of Addison and the humor of Steele with the terse sense of Thackeray; add the pathos of Dickens and the mellowing grace of Irving—but no, that would not equal it. Nothing like his prose was ever seen, nothing like it will ever greet this majestic world again. And this poet and essayist coming suddenly and strangely to the light, as I have intimated, became a ruler of journalistic destinies.

Nor was he led tremblingly up to the high place he was to occupy, but a true born genius he vaulted like a harlequin into the easy chair, which he subsequently mentioned to the world was located somewhere in "a dizzy eminence." True, it was said he made the leap without consulting the wishes of the founder of the enterprise, and stories are rife that a *coup de état* accounted for his presence at the helm, but evidently these are errors. And while it must be confessed that the wand which he flourished about so bravely at first, hitting foe and friend as pleased his mad caprice, has since become the merest lath, and he himself has tumbled from his high estate like the veriest Pantaloon,

still do I hold that while there he shone a star of most resplendent glory, and when he "oped his mouth" no dog essayed to bark. But he failed for all this, and the worst of it is no one can tell why he failed; no one can solve the riddle. Ranking first in the profession, the peer of Emerson as a scholar, the equal of Hassard, Chamberlain or Seilhamer as a trenchant editorial writer, a second Dana as a logician, and hardly inferior to Varley or Huxley in the matter of scientific research—to say nothing of his poetic fancy—he has proved a Jonah, and like him he has been thrown overboard by those associated with him. But so much of genius will not go unwept, unhonored or unsung. Tears are falling to-day like rain drops over the temporary absence of this blessed light from the fair firmament of letters. Already humble I have inaugurated an inquiry into the causes which render the success of great human luminaries so rare in this bad world, with a view to ultimately winning for him his rightful praise, and the time will come, I am certain, when a poet will arise to sing a requiem in remembrance of a gifted aspiring soul around whose name future generations shall weave garlands of love, honor and renown.

"McGrew—Brother of Bob's."

BY LEMONS.

HIS name was McGrew. He worked in a railroad way office. Several of our principal through wires were run into his office for testing purposes, but he used them for his own. He had a brother Bob, whom he imagined every operator in the country knew. Bob was his ideal; he thought there might be a few such operators as Bob in existence, but not many. Bob had been all over the country, from Maine to Texas, and of course was supposed to be widely known, and McGrew thought all that was necessary was to say, "I am McGrew—brother of Bob's," and any man would be glad to know him. Whenever there was a lull on the Washington "special" wire, this artist would call me up and ask me, "134?" After telling him it was Griggs, he would say, "Ah! Griggs, how are you to-night? My name is McGrew—brother of Bob's." I would say I was glad to know him, and tell him to be happy and virtuous—like Bob.

The next night he would call me up with his "134." I told him my name was Boggs. He replied, "Ah! Boggs, how are you this evening? I am McGrew—brother of Bob's." To which I responded that I didn't care much if he was. Then he would subside. At it again he would come the next night, and the next. I gave him a new name every night, until he flattered himself he would be as widely known as Bob himself, if he only persevered, and didn't grieve over the short answers he received.

But we settled him at last. One of the boys, named Mack, called him up one night and asked, "Is it McGrew—brother of Bob's?" He replied that it was; and Mack said, "My name is Rasmus; I know Bob very well. We were together two years out West and through the South. I would like to see you. Couldn't you get me pass to come out?" This tickled McGrew terribly. He replied, "Ah! Rasmus, I am delighted to meet you; glad to see any of Bob's friends. I am afraid I will not be able to pass you out; but, no doubt, if you asked the Superintendent of the road he would pass you." Mack replied, "No, the Superintendent has an old grudge against me; I wouldn't ask him; but never mind, I will walk out. I would do most anything to see a brother of Bob's; my dear old friend Bob! Many a day we have worked together. How sorry I was the day we parted." This was too much for McGrew, and he said, "Oh! no; don't walk out; I would rather pay your way—if I had the money. Don't think of walking; why, my dear friend, it is fifty miles to this place." Mack rejoined, "Oh! I don't mind the walk; Bob and I have frequently walked fifty miles a day on the plains. I am used to it. I will start about four o'clock in the morning. You can look for me in time to take supper with you. Good-bye, till I see you." McGrew concluded the dialogue with, "Well, if you will walk, all right. Good-bye; I will take care of you when you arrive," and, for the time, was presuadedly rejoiced.

In about fifteen minutes, however, Mack went back to the wire, and calling McGrew up, inquired if "That man Rasmus was talking to you to-night?" "Yes," replied McGrew, "what sort of a man is he? He is coming out to see me to-morrow." "Well, young fellow, I pity you," returned Mack. "You will have your hands full. That fellow has just got out of jail. He is one of the worst characters in the country. I expect that man will live on you for the next two months. That's the way he does, and you can't get rid of him, as he is terribly on his muscle." "Good heavens!" quoth McGrew. "Is there no way to stop him from coming? Couldn't you go and persuade him not to come? Tell him the roads are bad, and full of robbers. Tell him there was eighteen men murdered on that very road within the last month. Tell him I am a bad man. Tell him very likely I will kill him—

if he does anything to offend me in the least. Tell him anything, so you stop him from coming. I am going to see a nice young lady in this town, and dear knows what she will do if she finds I have acquaintances like that man."

Mack told him it would be impossible to stop him, that he had gone out now to try and steal a meal somewhere. "You had better receive him kindly," he concluded, "and don't aggravate him by treating him coolly, as he might abuse you, and he don't stop at anything when he is mad." McGrew answered very weakly, "I have the necessary courage, but I haven't the strength and muscular ability to cope with him. I will have some of my friends here with me when he comes, to protect me." The next night he called us up, and asked if Rasmus started for his place. Mack said, "Yes; keep a look out for him, he will be there soon." McGrew replied, "I have three men with revolvers and a shot gun in the office waiting for him. I have been to all the stores and hotels in town, and told them not to trust this man on my account, as I would not be responsible for any debts of his contracting." This was too much for Mack and the boys, they almost expired with laughter. Poor McGrew! He found out a few days afterwards when he was in town how cruelly he had been sold. He ceased to trouble us with "I am McGrew—brother of Bob's," and we were once more tranquil and happy.

[From *The Telegraphic Journal*.]

Duplex and Quadruple Telegraphy.

BY ARTHUR R. GRANVILLE.

WITHOUT question, the Americans are maintaining their ground for ingenuity and enterprise in the electrical world by turning their attention to telegraphic inventions. Although the practicability of duplex telegraphy was known as a scientific curiosity quite twenty years ago, it was far in advance of its age, and could not be put to any use by reason of certain difficulties—insuperable, according to the then known laws of electricity—so that the invention lay fallow for that period. A further reason for the invention not being followed up may be found in the fact that the traffic of those days was easily met, and telegraph engineers were not goaded on to investigate the difficulties attending the introduction of a system which, by enabling lines to perform twice their previous amount of work, has virtually doubled the efficiency of the wires in use.

To an American, Mr. Stearns, belongs every credit for dispersing those difficulties by a happy use of the condenser. Though not the inventor of the system—the honor of the invention belonging to Dr. Gintl, of Vienna, and W. H. Preece, of Southampton, Messrs. Siemens, Halske and Frischen, of Berlin—yet to him belongs the highest praise for having resuscitated an old laboratory experiment; for having nursed and trained it from infancy to maturity; and for introducing it to the practical world as a valuable system, requiring but slight additions to the instruments in use amongst telegraphers to render it ready for immediate practice. And so successful has the working of the "duplex" proved, that in a little over two years it has established itself as a great and most profitable system, and may be regarded as indisputably one of the most important turning points in the history of telegraphy and electrical science. It is reckoned equal in importance to the discovery of Steinheil, who demonstrated that return wires could be dispensed with by the use of earth plates. In resultant effects the "duplex" is strikingly similar to Steinheil's discovery, since both have doubled the resources of telegraphy—the former *directly*, by actually doubling the working capacity of wires; the latter by halving the lengths of lines, inasmuch as return wires were proved to be no longer needed.

The benefits arising from the "duplex" system bid fair to be multiplied still further by the joint labors of two Americans, Messrs. George B. Prescott and Thomas A. Edison, who announce the perfecting of what they designate "the quadruple system." This system is described as a "new process of multiple transmission, by which two messages can be sent simultaneously in the same direction over the same wire, and either message can be dropped at any way station on the circuit." The "duplex" system can also be applied to this "multiple" system, so that four messages may be despatched together over the same wire in the same direction. The recommendation in favor of the "quadruple" are that, like its predecessor, the old Morse key can be used, and the only expense attending its introduction is the purchase of additional parts of machinery; there is no sweeping away of old appliances and substitution of new ones. The Western Union Telegraph Company, of which Mr. Prescott is Electrician, is about to try this system—in fact, put it into practice on all their lines—so that we shall shortly learn with what success the system is capable of being worked. Of this we may be certain, that should fail—

ure threaten the system, Messrs. Prescott and Edison will not spare strenuous efforts to overcome whatever difficulties may present themselves.

How this "quadruple" result is obtained has not yet been explained, but the method is not difficult to conjecture. After the "duplex" had been perfected by Messrs. Gintl, Siemens, Halske and Frischen, other physicists endeavored to find a method exceeding even that, and the result of their researches was that, in 1855, Stark, of Vienna, proved two messages could be sent along a single wire in the same direction. His plan was to launch, by two keys, two currents of different potentials into the wire, to act upon two relays at the receiving station. These relays were arranged so that when the weaker current alone traversed the circuit only one relay was acted upon; when the stronger current traversed the line the other relay was worked; when both currents were in circuit, then both relays were set in action. How the arrangement was effected may be seen in Mr. Sabine's "History and Progress of Telegraphy," and it is no doubt this arrangement—perfected by the aid of modern experience gained in working the duplex system—which is about to be adopted in the offices of the Western Union Telegraph Company. Should this system succeed, there surely seems to be no reason why the number of messages capable of being transmitted along a given wire should not be still more increased by the addition of further appliances and the removal of difficulties, which, from experience gained in working the "duplex" and "quadruple" systems—may be even anticipated. Whatever, indeed, should be the ultimate perfection of the multiple system, whether by English enterprise or not, the chief honor belongs to the Americans for being the first adapters who cleared the way and acted as pioneers.

The Telegraphers' Mutual Benefit Association.

ASSESSMENTS 67 AND 68, ISSUED SEPTEMBER 14, 1874.

DEATH OF C. B. MATHEWS AND A. G. MARTIN.

C. B. MATHEWS (Certificate No. 2098, issued August 15, 1873) died at Chacahonla, La., August 5, 1874, of small-pox.

A. G. Martin (Certificate No. 376, issued December 4, 1868) died at Canoe Station, Ala., of bilious fever.

Two dollars are due on above assessments from members whose certificates are dated previous to August 5th, 1874; one dollar from those holding certificates dated between August 5th and August 26th, 1874.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENT NO. 66, UP TO AND INCLUDING SEPT. 11, 1874.

5, 6, 23, 25, 52, 54, 56, 59, 61, 67, 72, 80, 90, 93, 99, 103, 108, 114, 129, 134, 136, 139, 141, 142, 144, 146, 153, 175, 176, 177, 188, 201, 202, 235, 240, 244, 245, 247, 257, 278, 279, 281, 282, 283, 285, 286, 319, 328, 344, 351, 360, 367, 371, 372, 376, 379, 381, 391, 392, 393, 401, 405, 413, 414, 416, 425, 426, 430, 431, 456, 463, 478, 510, 520, 526, 533, 548, 554, 561, 576, 577, 594, 604, 618, 622, 672, 678, 680, 690, 715, 729, 730, 733, 735, 750, 751, 756, 769, 787, 791, 825, 830, 831, 832, 848, 855, 859, 871, 874, 880, 883, 886, 901, 927, 939, 943, 991, 992, 995, 998, 1024, 1028, 1040, 1047, 1054, 1055, 1058, 1081, 1088, 1090, 1099, 1102, 1173, 1193, 1194, 1196, 1200, 1241, 1251, 1266, 1274, 1277, 1292, 1307, 1308, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1318, 1319, 1320, 1321, 1322, 1336, 1371, 1372, 1385, 1389, 1390, 1391, 1402, 1403, 1404, 1410, 1412, 1428, 1437, 1438, 1440, 1453, 1482, 1485, 1488, 1500, 1501, 1511, 1515, 1522, 1537, 1569, 1576, 1580, 1582, 1591, 1593, 1594, 1623, 1625, 1626, 1632, 1634, 1707, 1721, 1728, 1732, 1736, 1745, 1790, 1791, 1795, 1796, 1797, 1804, 1810, 1817, 1818, 1823, 1824, 1847, 1869, 1874, 1906, 1911, 1913, 1914, 1931, 1938, 1951, 1969, 1985, 1994, 1999, 2000, 2001, 2024, 2025, 2027, 2036, 2040, 2044, 2048, 2069, 2082, 2099, 2113, 2118, 2119, 2123, 2125, 2137, 2162, 2172, 2195, 2196, 2202, 2212, 2214, 2216, 2223, 2224, 2226, 2232, 2240, 2243, 2261.

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63.—1182, 2127, 2194, 2199.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice, that an acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

The cable of the Post-office telegraph between Holyhead and Dublin has been repaired and communication restored.

The New Western Union Office of Cincinnati, Ohio.

THE well known building at the northwest corner of Fourth and Vine streets, formerly occupied by Squire & Eekstein in the drug business, has lately undergone, in a scouring of its stone facings, and in the manipulations by carpenters and joiners, frescoers, paper hangers, etc., so complete a change that, with its well seasoned raw materials, the rejuvenation renders it better than new. The last outfit was given on account of its proposed occupation principally by the Cincinnati branch of the Western Union Telegraph Company; and, in a minor way, by railroad companies and other business interests. Not as yet has the building received its finishing touches for habitation purposes, though the railroad companies have already established quarters on the first floor.

The Fourth street front of the ground floor is taken up by the passenger ticket and freight contracting agencies of the Indianapolis, Lafayette and Cincinnati, and Cincinnati, Hamilton and Dayton Railroads. These railroads have recently entered into a pooling arrangement as regards the profits on Western freight and passenger fares, and having done this, their agents are able to occupy a joint office in harmony together. Mr. E. L. Stark is passenger agent for the Indianapolis, Cincinnati and Lafayette Road, and Mr. A. F. Lindsay for the Cincinnati, Hamilton and Dayton Road. Mr. H. P. Clough is freight agent for the Indianapolis, Cincinnati and Lafayette, and Mr. W. H. Allen for the Cincinnati, Hamilton and Dayton. The corner they now occupy is more prominent and convenient than the time honored one on Third street.

The rest of the first floor of the building will be taken up by the Western Union Telegraph Company, which will not be ready to take possession for a month or more. The batteries will be located in the basement, and will consist of fifteen hundred cups. The number of wires running into the office from points outside of the city will be fifty-one, and including the city "loops," will be seventy-five or eighty. In the way of battery capacity, the new office will be much enlarged, as in the old place there are only one hundred and eighty Grove cups and five hundred of the Callaud description.

Back of the counter, on the street floor, will be the offices of the manager and the receiving and delivery clerks, and back of this, fronting on Vine street, will be situated the offices of the superintendent and his clerks.

The second and third floors will be for rent for offices. On the fourth floor will be the office of the Gold and Stock Company, and the telegraph company's reception room for those who call to see the operators, and a cloak and luech room for lady operators. The book-keeper's room, on this floor, fronts on Vine and Fourth streets, and its dimensions are fifty-six feet by twenty-eight feet. The entire fifth story, of dimensions of one hundred and four feet by twenty-eight feet, will be taken up by the tables of the operators.

The employes of the company are G. T. Williams, Superintendent; Frank Armstrong, manager; B. H. Johnson, chief operator, and three assistants; A. T. Gold, chief night operator, and two assistants; and W. J. Lawler, chief book-keeper. There are sixty-one operators, twenty-eight clerks and office boys, who perform clerical duty, and forty-two night and day messengers. The business of the company is very extensive. For the month of August the number of messages passing through it was 117,250. This is exclusive of press reports. For the press the number of words handled during the month was 2,045,018. The average is small, as during winter, when Congress and Legislatures are in session, and there is more general news, the number of words passing through the office is more than doubled. In summer the average of city messages is about 1,000 a day, and in winter, when business is brisk, from 1,200 to 1,500 city messages are handled.

The company will retain an office at the old headquarters on Third street in order to accommodate the bankers and other down town business men, who frequently require the transmission and reception of messages with a rush.—*Cincinnati Commercial*.

Robbery Prevented by Telegraph.

THE robbery of the residence of F. S. Winston, No. 18 West Thirty-first street, New York, was neatly and promptly prevented Monday. Two thieves broke open the grating under a basement window, worked their way to the first floor, and opening a door, started the alarm in the office of the Thirty-fifth District of the American District Telegraph Company. Patrolman Stacy, who was on the watch there, was at the residence of Mr. Winston so quick that the burglar had barely time to escape by the back door as he entered at the front, of course carrying no booty with them. The family was out of town, and had wisely left the key of the house with the telegraph company, whose alarm wire in the house was a certain protection against thieves.

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

A Reply to Journalistic Criticism.

CINCINNATI, O., Sept. 16.

"What do you read, my lord?"

"Words! words! words! Slanders, sir,"

—*Hamlet, Act II.*

TO THE EDITOR OF THE TELEGRAPHER.

THERE are many inconsistent things in the "make-up" of most men. We find men frequently doing the very things they pretend most to abhor. In moments of weakness we find them saying the very things they most savagely condemn in others. Napoleon professed the greatest contempt for Wellington's tactics at Waterloo, but, nevertheless, made unusual efforts in planning to counteract them. Santa Anna pronounced "Old Rough and Ready" "a fool" at Buena Vista, and yet he was fain at last to draw off his discomfited legions from the front of the unpretending but victorious little army of Americans.

I do not intend to dwell at length upon the language of the editors of the "Plug," but would simply remind them of what they must have forgotten (in the hurry of editorial business), that such language, though very forcible, is apt to react. That epithets rarely convince an antagonist in an argument, while they do often show a lack of effective artillery in the way of logic, and are often, like the Irishman's gun, most deadly at the breech.

When I observe that they have devoted nearly or quite three columns of the "Plug" to replying to "a fool," I must confess that they place nearly as low an estimate on their own ability as they do on mine, and certainly I could not hope to attract any greater notice to myself were I to resort to the same extensive vocabulary they have so largely chosen from. Reasoning from their own standpoint, I fail to see that their artillery has damaged any but their own forces.

The same elegant editorial hopes, too, that when the "Plug" shall be published on my standard, to see it "knocked higher than a kite." I suggested in my first, and would kindly repeat, that a slight elevation would be good for it. But I would offer as a mere speculation that its present prospects of an elevation to even the kite level, depend much upon the contingency of its enlargement. It would take too many copies now to cover a frame to make it at all probable that it will soon be used for kites.

He hints that he only knows of one course which would be likely to meet my approbation, and that would be to publish Watt's hymns, an old almanac, or Solomon's songs. Candor compels me to admit that he has rightly guessed. I do think Watt's hymns slightly superior in moral tone to the "Plug." Probably, too, some portions of Solomon's songs might be thought by men of ordinary culture to possess nearly equal literary ability. Solomon was forever lamenting his folly, however, and I would not recommend his writings, as being likely to please the taste of any who may happen to possess the culture requisite to render them admirers of the peculiar literature of the "Plug." He calls my words in behalf of the ladies, "Heroism in rushing into print." So be it. I had rather bear his sarcasm than wear the laurels he will win in attacking them through the personal columns of his paper. His brother editor, referring to them and what was said of them, remarks "that nothing had been said which should have offended the most fastidious." I happen to know that in one case the "personal" was so pointed as to produce the best evidence a lady can give of intense mortification and shame—tears. So much for heroism. In the concluding lines of the first editorial, to which I have briefly replied, he says, "Ah! well, the moon's at full." *Ay!* and it soon wanes. It was a new moon not long since, and promised well; but it was only a moon. It will wane, because its light is only the thin cold shimmer of reflection, and it shines much of the time—I will not say all the time—from behind the object it should illuminate. The second editorial, which I noticed briefly above in relation to the ladies, remarks that my ideas of the kind of journalism likely to benefit the class among whom it was to circulate, *i. e.*, scientific, well informed journalism, "would not only not be appreciated, but would be repudiated by practical telegraphers. They do not want the standard literature, nor what is suited to the religious, political, or sectarian public." Does he mean to say that they are mentally inferior to other classes of workmen, as, for instance, engineers? That they have none of the finer feelings or higher powers of other men? For his own sake, not to mention any personal pride I may have in the matter, I hope not. And, if it is true, then all the more reason why we should have a higher grade of journalism within our

ranks. However limited, too, may be my own knowledge of the wants of my professional brethren, I know that there are many who could and would appreciate the opportunities given by such a journal. "Our harmless criticisms, and our occasional sarcasms, have already proven of benefit" he says, and reasons that they prevent many mistakes which might work much damage—this, by rendering "the boys" more careful. I would suggest that a more potent means of producing accuracy is the plan now in operation in the W. U. Co., of deducting half the damage caused by the mistake from the pay of the one who commits the error. This plan certainly has the benefit of being intensely practical. He closes this column by remarking, "If *Nihil* had a more fraternal interest in native productions it would have given us more material of which to make of our paper what we desired it to be." I wonder if he can possibly mean that he desired his paper to be even partially made up of the contributions of a fool? Elsewhere he says, "they would have published cheerfully the item signed by *Nihil* Nameless." Why! he talks of *inconsistency*; calls me a fool! and then blames me for not contributing to the "Plug," and all within the space of a square foot of the valuable surface of the "Plug." Deduct that square foot, and you can make a *homœopathic* label of the rest of it. Possibly, while it is profitable to "the boys" to criticize *harmlessly* their little errors in receiving, it would be found not unprofitable to retouch some old forgotten author on spelling. Were a careful use to be made of Webster, we should not notice so many eccentricities in this direction. He professes, in the first issue of the "Plug," a "paternal interest" in the boys, and to be laboring to produce "greater harmony" among them, while his journal is filled with slurring allusions to their errors and picking at their peculiar habits and tastes. He "offers legitimate telegraphic amusement." Shade of Morse! Then follows an article on the "Art Gallery," the nature of which the operators here will understand. Truly, he sets up pins and knocks them down with the facility of *légerdmain*. Truly, logic falls apart mightily. In brief conclusion, let me ask all candid readers of THE TELEGRAPHER, ay! even of the "Plug," whether I am not right in the general statement that an elevated journalism is necessary and is obtainable? If telegraph operators have not often developed into Congressmen, lawyers or doctors, it does not follow that they may not. Besides, there live and practice to-day, in Cincinnati, honorably and successfully, a lawyer and a doctor, who have developed from the key. And while it will never be possible for all operators to become C. W. Fields or S. F. B. Morse, still it is possible to lift the profession to an honorable level with the other walks of life. At least, it is certain that the plan of feeding us with chaff is not the best way to try the experiment. I am glad that some of our journals pursue a different course. *NIHIL NAMELESS.*

The Proposed New Society of Telegraph Engineers.—III Feeling Among Telegraphers, etc.

CHICAGO, Sept. 22st.

TO THE EDITOR OF THE TELEGRAPHER.

THE wet, disagreeable weather experienced here and through the northwest during the past week has made telegraphing, to those at least who do service at the key, anything but a pleasure. Business is picking up very fast, and the different companies represented here all seem to be doing a thriving and remunerative business.

As the fruits of a recent discussion in the columns of THE TELEGRAPHER in regard to forming a society in this country somewhat similar to the Society of Telegraphic Engineers in England, there was last week an initiatory movement in this direction.

Some of the Knights of the Key in this section were disposed, in view of none but those in authority having been invited to be present at this meeting, to take it for granted that, as they were not asked, they would not be wanted hereafter to participate in such a society, but if my information is correct, the gentlemen mentioned met more by chance than otherwise, and had any other telegrapher, no matter how humble his position, chanced to have dropped into General Stager's room, he would certainly have been invited to remain and participate in the deliberations of the meeting. I am positively informed, by a gentleman who was present and participated in the deliberations, that the standard of knowledge to be possessed by applicants will not be placed so high by the by-laws of the society but that any telegrapher of good moral character and standing can gain an entrance. This is a step in the right direction, and shows just exactly what kind of men deliberated upon the matter the evening of this first meeting. "*Long may they wave.*"

There has been considerable quiet talk here recently among the fraternity, in regard to starting a society that should have the sanction of the officers of the different companies here, and that the society should be rather of a literary or glee club stripe, and in this way

get up a harmonious feeling, and let the matter spread, as such things generally do, to other places; and after enough of these local societies had been formed to make it a general one, and put forth general features, then something substantial might be accomplished. A great many things were hinted at, which would only occupy your valuable space to relate, and until some more tangible shape is assumed we will not tire your readers with a *resume* of the theories. One great objection to any society whatever, outside of a local society spoken of above, seemed to predominate, and that was the lack, or apparent lack of friendliness between operators at opposite ends of circuits to each other. It is claimed, and with a great deal of truth, that very few circuits will be found in any large office where there is not more or less real or imaginary hatred shown by the operators working it to each other, very frequently necessitating the interference of the different chief operators to settle the trouble, either by removal or threatened removal of one or the other operator in case trouble should arise again.

The causes are varied. Very often an operator who can take anything, but whose sending is no more readable than so much Greek, is set down at one end of a wire to work with a man who is, to say the best, an average receiver only, but a tolerably good sender. The result of such a match is easily anticipated; various other cases might be cited.

Very often two men, who are first class in every respect, fail to agree because, as a lady very facetiously remarked, "*They have never drunk together.*" Very often chief operators are to blame for such a state of things, as business done by such men will frequently be rushed back and forth at such a rate as to endanger the accuracy of the business itself in the endeavor to make each other "squeal." In a majority of cases, however, chief operators know very little of this state of affairs until some trouble arises. How much better would it be, when two men find they are not suited for each other, to either try to remedy the evil, if in no other way by a polite referring, mutually, of the matter to their several chiefs. We are not uncharitable enough to believe that any chief operator, who has any regard for the safety of the business for which he is responsible, delights in seeing such feelings engendered. It will not do to say that it will be all right when the boys meet—that they will fix up the little quarrel. The impression upon the manager of such men will be just the reverse of what is necessary to bring about such feelings between employer and employé, that one will look with confidence and good will upon the other. We must, by our manly bearing and our attention to business, show our superiors that we are entitled to their respect, esteem and confidence, before we have a right to expect it. Until that time arrives, until we have a right to claim the respect of our employers, we cannot expect to start any kind of a society that shall extend beyond certain local limits and restrictions. We must learn to forego showing up our brother operator, separated by a few hundred miles of wire, simply because his sending or receiving don't exactly suit us. It is probable that nothing will be done in regard to this local organization now until the *modus operandi* of "*The American Electrical Society*" shall be fully developed.

A very unsatisfactory trial was given to Foote and Randall's Automatic Telegraph system in the Gold and Stock rooms in this city on last Wednesday evening. The wire that the Western Union kindly furnished the inventor seemed to be troubled by sympathy from other wires on the same route, so that tracings of the foreign current (if it may be so termed) manifested itself on the chemical receiving paper when it was attempted to signal faster than 80 words per minute. We saw some very fine work exhibited, however, which was done at Buffalo, at from 200 to 300 words per minute. Buffalo and Chicago are the only two points where they have experimented with the machine, using ground connections to complete the circuit. Other tests, and very good and satisfactory ones it is claimed, have been made on metallic circuit. It looks like a very simple instrument to do such fast work. It seems to us, however, that before this machine can be a perfect success a separate wire, well insulated on poles where there are no other wires, will have to be erected for its use; the magnet being necessarily so sensitive that the induction current or sympathy, as you please to term it, from other wires on the same poles, would seriously affect the reliability of the signals, especially at as high a rate of speed as it is necessary to work an automatic telegraph so that it can favorably compete with the Morse. It must be remembered, however, that these gentlemen do not claim to have as yet perfected their invention.

Of course at the present time no communication from this city would be considered complete without some reference to "the Great Industrial Exposition." A stroll through it a few evenings ago, however, failed to reveal to me anything that would interest the fraternity. Perhaps "Occasional" may be able to find something, as he pronounces you, predicting that all those who exhibited telegraph apparatus and machinery last year

will be on hand this year. I tried in vain to find a single telegraph manufacturing firm in the whole building. NORTHWEST.

A Railway Telegrapher Cowhided.

TO THE EDITOR OF THE TELEGRAPHER.

QUITE an exciting scene transpired at a station on the Western Railroad recently. A few minutes after the eastern bound passenger train had left H—, Mo., Mr. S—, a teacher in the public school of that town, accompanied by his daughter and a lady friend, were seen rapidly approaching the depot. On reaching the office Mr. S— called out the operator, Johnny —, and accused him of circulating reports calculated to injure his daughter's reputation. This the young man stoutly denied, but our teacher's wrath could not be thus easily appeased. Turning to the girls, who in the meantime had engaged in a stormy dispute with their intended victim, he said, "Girls, did you come here to talk or for business? Do your duty!" A cowhide was then drawn from beneath the wrappings of each of the young ladies, but either through fear or compassion they seemed to feel a reluctance in carrying out the performance for which they had come. This seemed to exasperate the father, who, snatching a cowhide from his daughter's hand, seized Johnny by the collar, and laid on the lash with a vengeance. Down came the cowhide wielded by an unrelenting hand, raising a welt at every stroke. The young man's shrieks could be heard for a block, the young ladies meantime standing by and apparently enjoying the performance hugely. There would have been but little left of Johnny had it not been for the timely interference of a line repairer, who made the infuriated parent desist, and that in the face of a revolver. Calling to the girls, our teacher retired from the scene, doubtless convinced that the family name was fully vindicated and the disciple of Morse had received a lesson which he would not soon forget.

The assaulted telegrapher is now engaged pistol shooting at a mark, and vows that he will yet be even with his impetuous and cruel assailant. EMMOTT.

A Telegrapher Sold.

WISCONSIN, Sept. 18th.

TO THE EDITOR OF THE TELEGRAPHER.

I AM of the opinion that Webfoot, Will Honeycomb, Peter, and a few others of the "literary persuasion," whose communications have shone forth so frequently from the columns of the "THE TELEGRAPHER," will comment upon the murdered English and blind guessing of the writer in a vain endeavor to stir up the humorous feelings of the reader, but, "here goes."

"Fm." the worthy "burner of the midnight oil" at "Du," was sold, just a little, the other day.

One of the boys, who we will call "W.," came home to "Dn" on a visit. As soon as Mac, the "invincible" day man, who is ever ready for a joke, heard of his arrival, he told "Fm." that "W." had come to relieve him, and that he was "doue for." He nearly fainted at that, but, recovering, forthwith set out for the abiding place of "W." That day happened to be an "old toaster," about a hundred in the shade, more or less, and by the time that mile and a half was traversed, "Fm." was in a woe-be-gone condition. Sweltering with the heat, and nearly frantic with excitement, he rounded the last corner to his destination.

He espied his man, and opened on him with "Hello! 'W.'" I-I heard you e-came to take my place, w-well, I don't care. I-I don't want it." (Oh! uo!) "W." smiled, and informed him that he "wouldn't be found dead in that office," and wondered where he got that information.

"Oh! Mac told me." "Ha! ha! that's a good 'un. He has been sending you down here on a wild goose chase. It looks like a veritable 'Tom Collius joke' to me."

A smile of comprehension passed over the features of our friend that was indeed laughable to see, 'twas so "childlike and bland."

"Fm." decamped rather unceremoniously, wiser by experience, and when "Mac" and "W." met, they had a hearty laugh at his expense. F. D.

A Retrospect.

G. N. from N. Y., at 4 A. M. (P. & A., 1871.)

In ancient Thebes, as the story goes,
There stood a statue, from whose marble lips,
Touched by Aurora's rosy finger tips,
At early dawn the sweetest strains arose;
So comes across the distant hills the first faint beam of light,
Kisses the wire, and straightway thrills the welcome sound,
"Good Night."
J. F. H.
PITTSBURGH, PA., 1874.

In opening the New Zealand Parliament, the Governor in his speech, referred to cable communication with the other colonies, and expressed the hope that it would be speedily carried out.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, SEPTEMBER 26, 1874.

THE TELEGRAPHER:

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To the Friends of The Telegrapher.

It is with pleasure that we call attention to the new and liberal offer of PREMIUMS on the first column of the editorial page, to those who may be willing to exert themselves to obtain additions to the subscription list of THE TELEGRAPHER. We have usually published such an offer at this season of the year, and are willing thus to admit those who may aid us in maintaining and increasing the circulation of the telegraphers' organ to a participation in the benefits derived therefrom. These Premium offers have been very favorably received heretofore, and have resulted in interesting new assistants in the work of maintaining a telegraphers' organ, and calling attention to the necessity for constant effort and coöperation on the part of former friends and collaborators.

The independent course pursued by THE TELEGRAPHER—keeping it clear of complication with any telegraphic company or clique, and offering an opportunity for full and free discussion of all telegraphic subjects—naturally creates enmity and opposition on the part of some narrow minded and small souled individuals connected more or less prominently with the telegraph business. It has stood against the efforts of such persons heretofore to injure and destroy it, and has come out of all such contests hitherto more popular and prosperous than ever, and while it retains the confidence of the telegraphic fraternity, will, no doubt, continue to do so. We propose to speak the truth in regard to telegraphic matters and individuals without fear or favor, whoever may be pleased or hurt thereby. All honest and genuine advances or inventions in electrical science and telegraphic art will be recognized and advocated, while appropriators of the ideas and inventions of others—charlatans and would-be impostors—will continue to be shown up in its columns, as heretofore, in their true characters and colors.

In short, we propose that THE TELEGRAPHER shall continue to be in all respects an honest, reliable and independent telegraphic journal. No effort is spared to constantly improve it and make it more worthy and creditable to the fraternity as their representative and the telegraphic journal of the country.

In conclusion, we would again ask every telegrapher who has faith in the paper, and who considers its continuance and efficiency desirable and essential, to consider himself or herself an active agent for adding to its subscription list and material support. We await with confidence the hitherto never failing response to this request.

The Edison and Prescott Organ and Fast Systems of Telegraphy.

THE last number of the *Journal of the Telegraph* ventilates the ideas of Messrs. EDISON and PRESCOTT on the subject of "Fast Systems of Telegraphy" at considerable length. In 1870 Mr. PRESCOTT, in the interests of the Western Union Telegraph Company, published in the *Scientific American* a long communication, in which he demonstrated to his own satisfaction that the automatic telegraph system, then coming into general notice, was a failure as regards speed and economy. As time passed on and the statements, arguments and deductions of the writer were proved by actual performance in practical business operations to be unfounded and unreliable, the friends and advocates of automatic telegraphy from time to time have quoted this article and compared it with what was actually accomplished, much to the annoyance of the writer, whose zeal and haste had led him into making state-

ments as an electrician which proved more damaging to his professional reputation than to the system he had attempted to decry. Goaded at last by these constant references to his literary and professional *faux pas*, he attempts to wriggle out of the dilemma. For this purpose the *Scientific American* article is reprinted in the *Journal*, and an attempt is made editorially to show that the article was not so entirely without foundation as had been supposed.

One of the arguments relied upon to demonstrate this is that after five years only one line—that between New York and Washington—uses the automatic system. This, even if true, which it is not, amounts to nothing as an argument. A wire on the Philadelphia and Reading line was worked extensively by the automatic system for a long time, and we believe is now being thus worked very successfully. The automatic system has also been very successfully used by the Southern and Atlantic Company in a direct circuit between Charleston, S. C., and Washington. The comparison between the automatic systems used in Europe and in the United States amounts to nothing, as they are entirely different affairs. The WHEATSTONE duplex, used by the British Government to a limited extent upon the telegraph lines, is known to be comparatively slow; and yet the Western Union Company, under the guidance of its electrician, are now engaged in trying to adapt it to use upon its lines. "People who wish to send telegrams promptly are not going to wait for them to be first punched, and then transmitted, and then slowly and laboriously copied out by hand," says the *Journal*. It is a sufficient reply to this that they do wait, and are apparently satisfied that their messages, notwithstanding these three processes, are delivered as promptly, at least, as by any other method, if we may judge from the fact that the lines of the Automatic Telegraph Company are doing a good and constantly increasing business.

We have not space to follow out the subject, and will only say that Mr. PRESCOTT, in his second attack upon automatic telegraphy, has not bettered his case, and substitutes assertions which experience has disproved for argument.

But it is when the achievements of PRESCOTT and EDISON came under consideration that the writer warns up to his theme. The automatic inventions of LITTLE, WHEATSTONE and others sink into insignificance alongside of the great "quadruplex" invention, which is bound to at once revolutionize telegraphy and carry the inventors, the Western Union Telegraph Company and all concerned, on to glory and fortune. When this great invention is fully developed all other fast systems of telegraphy must subside into insignificance, and disappear from the face of the earth like the dew before the morning sun. This great "invention" has by no means been abandoned, notwithstanding the rude shock which was given it in the article published in THE TELEGRAPHER of July 18th, under the caption of "The Dutch have taken Holland." It still lives and thrives, as it has done since Dr. STARK of Vienna, in 1855, demonstrated the practicability of sending two pulsations simultaneously over a wire in the same direction and recording them. We have in the *Journal* marvellous accounts of the performance of the "quadruplex" under favorable conditions, but we are not favored with a statement of its workings on any other but the best wires and with perfect insulation, and with good climatic conditions.

In this connection we would call attention to an article from *The Telegraphic Journal*, of London, which we reprint on another page, in reference to the duplex and quadruplex, the writer of which seems to be somewhat satirical on the pretended new inventions of EDISON and PRESCOTT, and cruelly gives it to be understood that the new invention is really a very old affair, and goes on to describe how it is done. He evidently has not that overpowering appreciation of the genius of the reinventors that they have themselves, and it is to be feared that an application for a patent on it, were he the examiner, would scarcely meet with favor.

We shall refer to these matters again hereafter, but for the present have neither the time or space requisite to give them fuller consideration.

The *animus* of the *Scientific American* article above referred to was, evidently, that the Western Union Company, not owning the automatic system, was interested in its being decried, and the public made to believe it of little or no value—of this later emendation, that automatic and quadruplex are not likely to thrive together.

The American Electrical Society.

We print in another column an account of a meeting of electricians and practical telegraphers, held in Chicago on the evening of the 14th inst., to take action for the formation of an association for the advancement of electrical science in this country. We are assured that this is an earnest movement, and that it will be effectually and permanently carried out.

THE TELEGRAPHER has long and persistently advocated the formation of such an association as demanded by the best interests of the telegraph, and it gives us great pleasure to be able to record the initiatory steps for this purpose. It is scarcely necessary for us to repeat the advantages to be derived from such an association of the able electricians and practical telegraphers of which there is no lack among us.

The movement is in good hands and will not be suffered to flag for want of interest in it. The organization is intended to be catholic in its character, and to admit to active participation in its proceedings all who are interested in the advancement of electrical science. Its progress will be watched with interest, and there is no doubt but that it will prove not only advantageous but creditable to the electricians and telegraphers of the country.

The "Organ" Business.

It has been generally supposed that the *Journal of the Telegraph* was the official organ of the Western Union Telegraph Company. We have shared in this belief, and have occasionally referred to it as such. Of late, however, its character has been changed, and it has now become the personal organ of TOM EDISON and Mr. GEORGE B. PRESCOTT, the latter occupying the position of electrician to the company. It is EDISON and PRESCOTT and PRESCOTT and EDISON, *ad nauseam*. It was always heavy and dull, as became an "official organ," of which, as its circulation is mainly to the officers and employes of the company gratuitously, and as those to whom it was sent were under no painful obligation to read it, there was no reasonable cause for complaint, and it served a useful purpose in circulating the orders, tariff rates, etc., of the company.

As a personal organ, however, run in the interest of the two parties named, to advance their purposes and manufacture fame, reputation and fortune for them exclusively, it is quite a different affair, and is open to criticism. The electrical idiosyncrasies of EDISON and PRESCOTT (since they have entered into partnership) are fully set forth in its columns; and if much puffing could render them valuable they would be the most remarkable scientific geniuses of the present or any former age. Unfortunately for them, outside the limited "ring" of which they are the principal members, they are not regarded as the bright and shining lights which they evidently consider themselves. However effectually they may succeed in convincing the President of the company of their preëminent abilities and attainments, electricians and practical telegraphers refuse to accord them the high position in electrical science and practical telegraphy to which they aspire. In fact, they are regarded rather as pretenders than as actual electricians and scientists.

Not content with one "organ," however, we notice that they have adopted a nondescript sheet called *The Operator*, of which a few of our readers in this vicinity may have heard, as a sort of sub-organ or tender upon the larger and more pretentious sheet. Recent issues of this publication have contained such fulsome and ab-

surd slaverings of EDISON as to make that person appear even more ridiculous than he otherwise would. It is generally believed that these are the productions of his own pen, as it is not reasonable to suppose that any other person would venture to expose even him to such ridicule as must be caused by the stuff that appears in its columns. The "organ" business is truly being run into the ground.

The Steamer Faraday not Heard From.

THERE is something very singular about the disappearance so long from public notice of the steamer Faraday and the Direct United States cable, which it is engaged, or supposed to be engaged in laying. The last heard from her is from the steamship *Algeria*, of the Cunard line, that arrived here on Sunday last, which reports, Sept. 15th, in lat. 50° 34' lon. 25° 06', passed two steamers bound west, supposed steamships Faraday and consort.

There are not wanting those who are uncharitable enough to assert that, having failed to obtain the royal assent to the act which would permit the landing of the cable at Newfoundland, it is not desired or intended to lay and operate it this season. Unless it is completed within a very few days it is certain that it cannot be done before next summer.

Reminiscences.

"In the days of 'Auld lang syne.'

While reading THE TELEGRAPHER we are more forcibly reminded of its editor, J. N. Ashley, when we recall the days of the House Telegraph. We were in Columbus, Ohio, when our friend Ashley had the House in charge. We were in the 'National' lines then, and Jim Ware was our manager.

This was a matter of about twenty-one years ago, and often our youthful ears heard the interchange, between Jim and Ashley, of those magic and expressive letters, F. S. We saw them appended to office inquiries and social questions, and they were so indelibly fixed upon our mind that we recall that time as though it were but yesterday. We lost track of our friend Ashley until lately, when we ascertained the proper identity. If his memory should not serve him as tenaciously as ours regarding the mystic letters F. S., we will write him.—*The Plug*.

We well remember the season passed in Columbus, Ohio, in charge of the House Printing Telegraph office. We were somewhat younger then than now, but we have kept in kind remembrance the telegraphers connected with the Wade and National lines at that place, who, notwithstanding business competition and rivalry, were friends and social companions. WARE left the business about the time that we shook the mud of Columbus off our boots and returned to the east and the old New York and Boston House line. He was a good fellow, and we hope that he has met with success in life, which he certainly deserved to do. As to the mystic letters, F. S., to which our cotemporary refers, we must confess that their meaning has faded from our recollection, and we should be glad to hear from him, as promised, by letter, on that and other matters relating to the olden time, when we went west with anticipations of telegraphic success and progress which a few months' experience satisfied us were not to be realized.

Personals.

Mr. CLINTON H. SCOTT, formerly manager of the Wellsboro', Pa., telegraph office, has resigned and engaged in the coal business at Towanda, Pa.

Mr. H. A. CLUTE, Superintendent of the Lehigh Valley and Penna. & N. Y. R. R. Co.'s Telegraph, is at present engaged (in New Jersey) in the construction of a telegraph line over the Easton and Amboy R. R. (an extension of the Lehigh Valley R. R.) The line will extend from Easton to Perth Amboy, a distance of sixty-five miles. A peculiarity about this line from any others yet built in this country will be the use of a No. 11 galvanized steel wire on Brooks' Patent Insulators. The poles will be set sixteen to the mile. The E. & A. R. R. will be in partial operation by December next, and it is expected that early in spring the whole road will be in complete operation.

Mr. JOHN H. DWIGHT, who has had charge of the Western Union Company's interests in Albany, N. Y., for a year past, has been transferred to 145 Broadway, New York, where he has entered upon the duties of chief operator, *vice* Mr. Gerritt Smith, promoted to assistant electrician.

Mr. JAMES H. RUGG, an old and widely known telegrapher, succeeds Mr. DWIGHT as manager of the Albany office.

Mr. M. L. MORGAN, late assistant chief operator, has been promoted to chief operator, Albany office, *vice* Mr. JAMES H. RUGG, promoted to manager.

The Telegraph.

By Cable.

THE FARADAY NOT HEARD FROM.

LONDON, Sept. 18.—The steamer Faraday, engaged in laying the direct cable, has not been heard from for several days. It is the impression of the officers of the company that the cable has been broken and that the Faraday is engaged in grappling for it.

LONDON, Sept. 18.—Nothing has been heard from the steamship Faraday, laying the direct United States cable, since the 9th inst., when she payed out 574 miles and was in water over two miles deep.

It is supposed here that the cable broke in the gale of the 10th inst., and that the Faraday is trying to recover it.

Annual Meeting of the Gold and Stock Telegraph Company.

THE annual meeting of the Gold and Stock Telegraph Company was held at the office of the company on Tuesday last, September 22, and the following directors elected to serve for the ensuing year: Marshall Lefferts, William Orton, A. B. Cornell, G. B. Prescott, James H. Banker, George H. Mumford, Norvin Greene, Tracy R. Edson and Henry R. Pierson.

Foreign Telegraphic Notes.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended Sept. 5, 1874, was 392,133—an increase of 30,361 on the corresponding week of last year.

The Western and Brazilian Telegraph Company have notified that their cable between Pernambuco and Bahia being under alteration, the through communication with Bahia and stations beyond is temporarily suspended. Pending the interruption, all messages for places south of Pernambuco down to Buenos Ayres and the West Coast of South America will be sent by post between Pernambuco and Bahia, to be telegraphed thence to their destination.

The Great Northern Telegraph Company have obtained a concession from the Chinese Government for the establishment of a land line from Amoy to Foochow, and as the erection of it has already been commenced, the important port of Foochow will soon be in telegraphic communication with Europe. In Japan the company's repairing steamer is at present submerging cables on account of the Japanese Government to connect Nippon and Yesso.

The official report of the telegraphs in the Swiss Confederation during the first six months of the present year shows that 775,316 telegrams were despatched from one part of the Republic to another—being an increase of 84,000 in the corresponding period of last year. The foreign telegrams arriving and despatched number 237,210, showing also a slight increase. The receipts have also increased to 759,051fr., but the expenditure has also been augmented, and there is a deficit on the whole of over 110,000fr.

The receipts of the Great Northern Telegraph Company for the month of August amounted to 414,553fr. (£16,582), and for the month of August, 1873, to 331,238fr. (£13,249). The total traffic receipts from the 1st of January to August 31 amounted to 2,914,362fr. (£116,574), and for the corresponding period in 1873 to 2,053,350fr. (£82,134)—showing an increase of 861,012fr. (£34,440).

The receipts of the Submarine Telegraph Company for August, 1874, were £8,853, against £8,439 for the corresponding month last year.

The number of messages of twenty words that passed over the Barcelona-Marseilles Cable was, for the month of August, 6,138.

The number of messages passing over the Cuba Submarine Telegraph Company's line during the month of August amounted to 1,725, estimated to produce £2,000, against 1,260 messages, producing £1,216 in August last year.

At Demerara, West Indies, arrangements for the construction of the system of inland telegraphs to connect the West Coast of Demerara and Essequibo with New Amsterdam, authorized by the Court of Policy, are in progress.

Telegraphic and Electrical Brevities.

The poles are all up between Jessop, Georgia, and Jacksonville, Florida, on the Great Southern Railroad; the wire, and insulators, and brackets, have been forwarded by the Southern and Atlantic Telegraph Company, and the line will be completed and put in operation immediately.

The section of the International Ocean Telegraph Cable between Key West and Punta Rasa is again interrupted, and messages are carried between those two places by steamer.

The American Electrical Society.

On the evening of Sept. 14th a meeting of electricians and practical telegraphers was held in Chicago, at the rooms of Gen. Anson Stager, General Superintendent of the Central Division of the Western Union Telegraph Company, for the purpose of taking measures looking to the formation of an organization for the advancement of electrical science in this country, corresponding, in some respects, to the Society of Telegraph Engineers, which has proved so successful in England.

Mr. C. H. Haskins, General Superintendent of the Northwestern Telegraph Company, was called to the chair. Mr. C. S. Jones, Superintendent Illinois Central Telegraph, was appointed Secretary.

The Chairman, after stating the object of the meeting, proceeded in a few brief but well chosen remarks to set forth somewhat in detail the character and aims of the proposed organization. A free interchange of opinion then took place among those present, in reference to the most efficient plan of organization; it being generally admitted that the peculiar circumstances to be met with in this country rendered it necessary to adopt one in many respects essentially different from that of the English society. The general sense of the meeting seemed to be that the new society should be made, as far as possible, of a practical character, and the conditions of membership such that every person, however humble his position, who is really interested in the advance of electrical science, should be able to avail himself of its advantages, so that its benefits should be confined to no one class, nor particular section of the country.

Some discussion also took place in regard to the name of the proposed association, and that suggested by Mr. F. L. Pope, of New Jersey, viz., "The American Electrical Society," was finally agreed upon.

A committee of five was then appointed by the Chair to draft a constitution and by-laws, consisting of the following gentlemen:

C. H. Summers, Chicago; Gen'l Anson Stager, Chicago, F. L. Pope, Elizabeth, N. J.; F. H. Tubbs and C. S. Jones, Chicago. This committee were also instructed to issue a circular of invitation to all interested to attend a meeting for the purpose of completing the permanent organization, which meeting is to be held at Chicago on the third Wednesday in October, and at which time the committee on the constitution were instructed to report. After some further conversation the meeting adjourned. A marked interest was taken in the matter by all present, and great confidence was expressed that the proposed society would prove an eminently prosperous and useful one.

Hymeneal Presents to a Western Union Cashier.

The marriage of Mr. George P. Riley, the attentive cashier of the Western Union Telegraph Company in this city, to Miss Maria C., daughter of ex-alderman Norton, of Troy, was solemnized in St. Joseph's Church of that city last Thursday. The young people were the recipients of several beautiful and costly presents, among them a splendid French bronze clock, from Mr. R.'s associates in the telegraph office. We hope the future of the young couple will be as bright as their friends could wish.—*The Press (Albany, N. Y.)*

Complimentary.

MANAGER John H. Dwight, of the Western Union Telegraph Company, has been promoted to the position of senior chief operator (a post he is eminently qualified to fill) of the New York office. Mr. James H. Rugg, a well and favorably known telegrapher, has been promoted to the managership, and Mr. M. L. Morgan chief operator of the office here. These promotions have been earned by many years' faithful service. The public generally will be glad to learn of this commendable act on the part of a great company.—*The Press (Albany, N. Y.)*

New Patents.

For the week ended August 11, 1874, and bearing that date.

154,002.—ELECTRIC TELEGRAPHS. Wm. C. Barney, London, England. Filed January 21, 1874.

Opposing batteries connected by positive poles at each end of line. When transmitting from a station, battery at that station is short circuited through a resistance current from receiving station going over line and back by earth, making record at its own station in instrument placed between negative pole of battery and earth, the earth or extra currents being cut off by resistances placed between earth and the instrument.

1. The combination with an insulated line having batteries at each terminal thereof, placed with their positive poles to said line, of the resistances R R', arranged between the receiving instrument and the ground, substantially as and for the purpose set forth.

2. The combination, with the insulated line, as described, and resistance R R', of the additional resistance R' and battery F, arranged and operating substantially as set forth.

3. The combination with an insulated line of a battery having its positive pole coupled to the line at the transmitting end and to the wire brush b, while the negative pole of the battery is coupled to the earth line through resistance R, substantially as and for the purpose set forth.

154,029.—ELECTRIC HOTEL ANNUNCIATORS. Louis Finger, Boston, Mass. Filed December 31, 1873.

Improvement in devices whereby a shield is caused, through a series of impulses, to designate at an aperture the nature of the want signaled for.

1. The combination of the rotating character shield or plate, or a series of such shields, with a single shaft, which at once constitutes the axis of said shield or series of shields, and the means whereby the said shield or shields, after having been actuated by the electro-magnetic apparatus, may be returned to its or their normal position, as shown and set forth.

2. The rotating shield or character plate, and escape pins projecting laterally from said plate, in combination with the magnet, armature and pallet carried by the said signature, constructed and arranged for joint operation, as shown and set forth.

3. The combination of shaft F, register I pins k and l, or their mechanical equivalent, and spring H, arranged for joint operation, as shown and set forth.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

SEPT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
17	79 1/2 80	.....	.....
18	79 1/2 79 3/4	.....	.....
19	79 1/2 79 3/4	.....	.....
21	77 1/2 78 1/2	.....	.....
22	78 1/2 78 1/2	.....	.....
23	78 1/2 78 1/2	.....	.....

Married.

RILEY—NORTON.—In the City of Troy, N. Y., Sept. 17, 1874, at St. Joseph's Church, by the Rev. M. Driscoll, GEORGE P. RILEY, Cashier W. U. Co.'s Albany, N. Y., office, to Miss MARIA C. NORTON, of Troy.

The employees of the Western Union, Albany, N. Y., telegraph office, presented Mr. RILEY with an elegant bronze clock on the occasion of his marriage.

VAN SIZE—FELLOWS.—At Albany, N. Y., Sept. 22, 1874, by Rev. F. R. Morse, Mr. Wm. B. VAN SIZE, chief operator, Atlantic and Pacific Co.'s, Albany, N. Y., office, to Miss MARIAN G. FELLOWS, of Albany.

Mr. VAN SIZE was kindly remembered by his office associates in the happy occasion, they presenting him with a handsome silver ice pitcher.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents.
UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

GLASS VISITING CARDS.

RED, BLUE, WHITE.

CLEAR AND TRANSPARENT.

Your name beautifully printed in Gold on One Dozen for 50c.; post paid, three dozen, \$1.

Must have Agents everywhere.

Outfits, 25c.; Samples, 3c.

F. K. SMITH,

BANGOR, MAINE.

ANDERS' MAGNETO PRINTING TELEGRAPH INSTRUMENTS.

These instruments require

NO ACIDS OR CHEMICAL BATTERY,

the currents required to operate them being generated from PERMANENT MAGNETS.

They print very rapidly, and having been fully tested on private lines during the last eighteen months, have proved to be

VERY RELIABLE.

The following parties, among others, have purchased them after giving them

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on their several lines:

- THE BOYNTON PACKING COMPANY, Boston, Mass.
- CHAS. HULBERT, Esq., 8 Exchange Place, Boston, Mass.
- THE BOSTON AND ALBANY RAILROAD CO., Boston, Mass.
- MESSES. J. H. CHADWICK & CO., Boston, Mass.
- JAMES ALEXANDER, Esq., Agent Cunard Steamship Company, Boston, Mass.
- CHAS. S. LOVERING, Esq., Treasurer of Whittenton Mills, Taunton, Mass.
- HON. ISAAC BRADFORD, Mayor of Cambridge, Mass.
- GEO. H. COPELAND, Esq., Chief of Police for the Cambridge Police Telegraph, Cambridge, Mass.

We also continue to manufacture

ANDERS' MAGNETO DIAL TELEGRAPH INSTRUMENTS,

which have been extensively used for several years, and are recommended as the

BEST DIAL INSTRUMENTS MADE.

Parties who purchase either our PRINTING OR DIAL INSTRUMENTS can exchange one for the other at any time, as both the Printers and Dials are used with the same transmitters.

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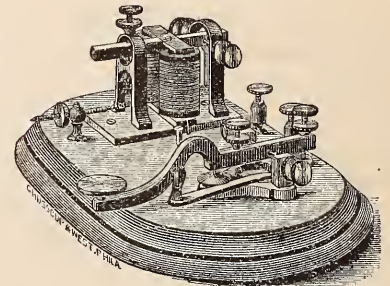
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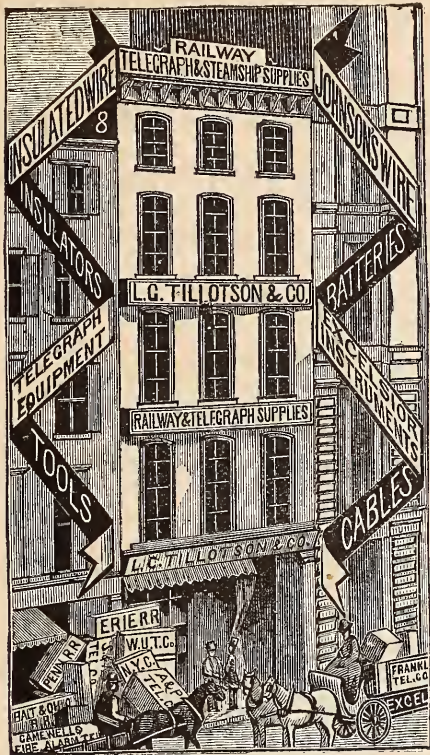
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 They have the **GREATEST VARIETY.**
 They carry the **LARGEST STOCK.**
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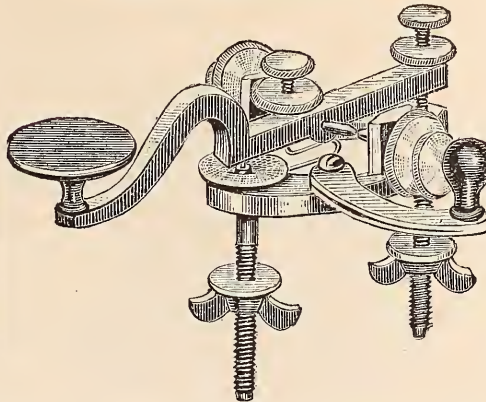
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PATENT CIRCUIT-CLOSER KEY.

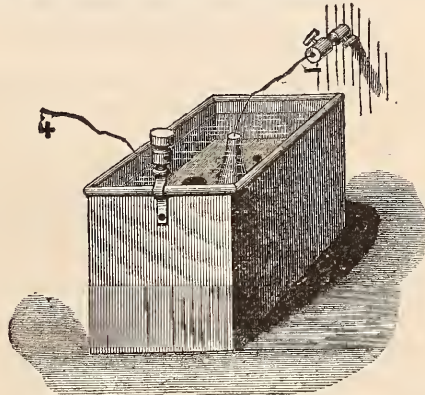
Does not keep line closed by binding against the anvil.
 Will not jar open.
 Slight pressure of the finger required to put lever in circuit or cut out.
 Acknowledged to be a decided improvement.
 Price, same as the ordinary key.
 Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

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 SUPERIOR INSTRUMENTS AND BATTERIES,
 at the same prices offered by other establishments.

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Durability, Efficiency, and Economy of Expense
 and **Labor at last Secured.**

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2. Descriptive circulars and price list forwarded upon application to

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- RELAYS unequalled for beauty and strength.
- GIANT SOUNDERS, without a rival for clear, loud sound.
- STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
- REGISTER SPRING and WEIGHT, of approved patterns.
- POCKET RELAYS, in Hard Rubber Cases; new style.
- BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
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- RELAY, SOUNDER and KEY on same base, making an elegant set.
- WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

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San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
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Quebec, L. C.,
Rochester, N. Y.,
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St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the
apparatus may be distributed in a combination of circuits, and
the entire system successfully worked, without the constant per-
sonal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**,
adapted to produce the full tone of the largest church or tower
bells.

Fourth—The **Electro-Mechanical Gong Striker**,
for hose and engine houses, by means of which the location of
the fire is instantaneously communicated to the members of
each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by
the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of
practical use, and that the efforts which have been repeatedly
made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to
adopt other systems having demonstrated their insufficiency
and unreliability, and resulted in their abandonment, and sub-
stitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the
original *FARMER & CHANNING PATENTS*, one of the most
important of which has just been extended for seven years, and
during the past seventeen years have spared no expense or effort
to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have
adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little ex-
pense, compared to the benefit which it confers, that even small
communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of
the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POS-
SIBLE IMPROVEMENT which shall increase the

EFFICIENCY,
RELIABILITY and
ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruc-
tion, and the number of lives which have been preserved
through the general adoption of this system, throughout the
UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for
any considerable length of time, they have been enormous, **THREE**
CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its in-
troduction into their localities is cordially invited, and
their efforts will be duly appreciated and
compensated.

Any information desired in regard to the above
system will be cheerfully and promptly furnished
upon application at the office.

A pamphlet, setting forth more fully its advantages and
superiority, has been printed, and will be supplied to Municipal
Authorities and others interested in Fire Alarm and Police Tele-
graphy, upon application as above.

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AND MANUFACTURER OF

INSTRUMENTS,

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AND EVERY DESCRIPTION OF

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BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, a
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Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-
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each different connection only one square inch of space, and
though made of the largest size, not subject to the warp and
contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three
years, an Insulated Wire which can be buried in the earth or
exposed to rain and sun, or to the vapor of acids, without injury.
Professor SILLIMAN, who has exposed it to the most destructive
agencies, finds that it remains uninjured in an atmosphere of
ozone, which would destroy gutta-percha in a few hours. It
exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article
for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will
exceed, in insulation for submarine purposes, ANYTHING
HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and
size of cable, which will be found to compete with any other
construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY,
with Patent Platina Connection, introduced by us eight years
since; also, THE ALPHABETICAL OR DIAL TELEGRAPH,
now extensively used in this and other cities for private lines,
being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that
will work practically with a single DANIELL cell, a **BATTERY**
that does not require to be taken down but once a year, and the
very best **MAIN LINE SOUNDERS** made

Our **CATALOGUE**, embracing a large amount of new matter
and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior

PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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COPPER FOR CONDUCTIVITY.
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The superiority of the COMPOUND TELEGRAPH WIRE, compared with iron, consists in its LIGHTNESS, reducing by over fifty per cent. the number of poles and insulators required.

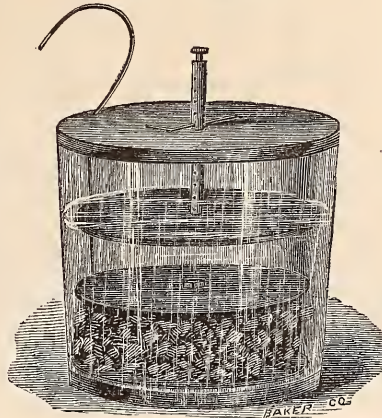
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 And in its DURABILITY, which greatly exceeds that of the best galvanized iron wire.
 Altogether resulting in a very great reduction in the cost of maintaining and working telegraph lines, while, at the same time, insuring

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This Battery gives a stronger current than the same size Hill or Callaud Cups. It will run as a local battery for six months without attention, and as a main battery for a longer period.

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of any desired size and resistance, will be supplied upon orders through us, at the Manufacturer's lowest prices.

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 Sole Agents for the

EAGLES METALLIC GALVANIC BATTERY.

The demand for this Battery is rapidly increasing, and it is conceded by all who have used it to be the *Best and most Economical* Battery, for telegraphic and other purposes, offered to the public.

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by Mr. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,
 Author of "Telegraph Companion," "Telegraph Manual,"
 "History of America," "Civil War in America;" Member
 of many Scientific and Learned Societies of Europe
 and America; Commander of the Order of Dan-
 nebrog, Denmark; Order of St. Olaf,
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This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

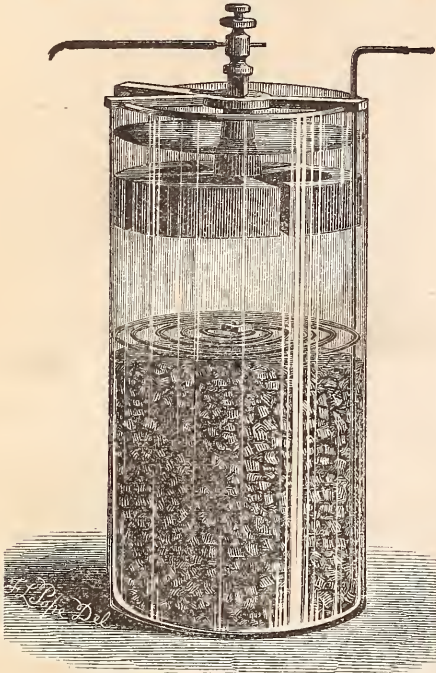
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given
 The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
NO. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS for telegraphic purposes, or closed circuits of any description. This Battery received the FIRST PREMIUM over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for MORE THAN ONE YEAR, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION, and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a **LOCAL BATTERY,**

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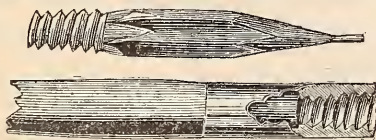
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. Send for Circular.

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SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

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W. H. SAWYER, Secretary.

ORTON'S PATENT PENCIL HOLDER.



"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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BATTERIES, TOOLS,
INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

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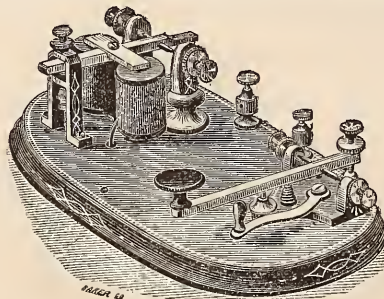
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COPPER & COMPOUND KERITE WIRE.

CABLES TO ORDER.

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GEO. H. BLISS & CO.,
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PRIVATE LINE INSTRUMENTS.



Price, \$10.00.

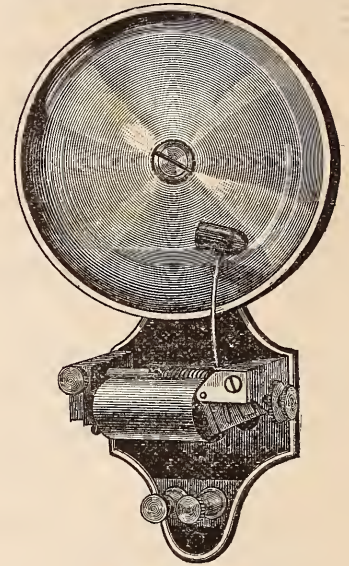
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One half of actual size

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The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

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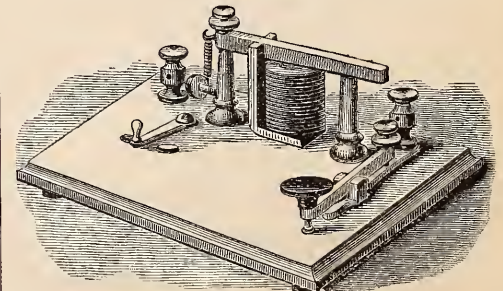
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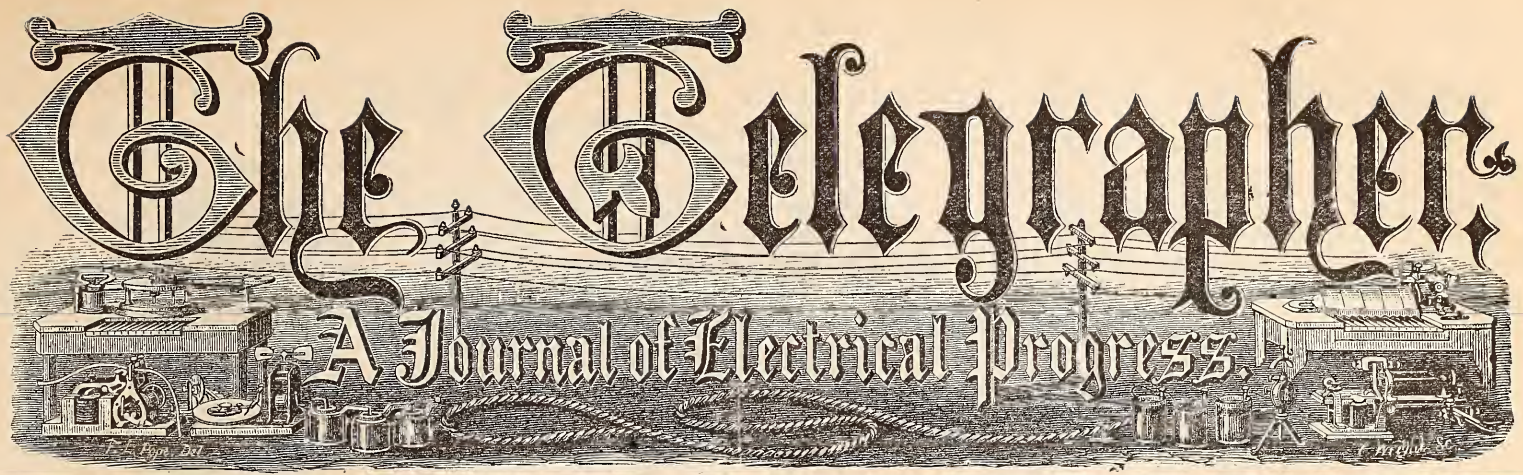
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, October 3, 1874. Whole No. 429

CHARLES WILLIAMS, JR.,
109 COURT STREET, BOSTON, MASS.,
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TELEGRAPH INSTRUMENTS
OF ALL KINDS,
GALVANIC BATTERIES,
JONES' PATENT LOCK SWITCH,
PATENT ELECTRIC GONGS,
PRINTING TELEGRAPH INSTRUMENTS.
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Instruments,
"Pope's Modern Practice of the Electric Telegraph,"
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AT THE LOWEST PRICES.

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CHAMPION LEARNERS' APPARATUS,
with Complete Instructions, Battery, Wire, etc.,
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Batteries and Supplies of every Description.

Send for Circulars and Catalogue.

WESTERN ELECTRIC
MANUFACTURING COMPANY
FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
SINGLE CONNECTING CORD.
Western Electric Manufacturing Company,
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CHARLES WILLIAMS, JR.,
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109 Court Street, Boston,
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DAY'S KERITE COVERED WIRE.

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PATENT INSULATED TELEGRAPH WIRES,
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BRAIDED LINEN or COTTON COVERED WIRE,
saturated and finished with our Patent Compound, which makes the most durable, handsome and best insulated Braided Wire manufactured.
PAINTED, PARAFFINE or SHELLAC WIRES
also furnished at the lowest prices. Iron or Compound Wires covered upon reasonable terms.
We are also prepared to furnish a new style of
ELECTRIC CORDAGE,

which has been pronounced by all superior to any in the market.
The American District and Gold and Stock Telegraph Companies have been supplied from my works with a greater portion of the office wire used by them.

Sample Card and Price List furnished when requested.
Phillips' Wire can be had of

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General Superintendent's Office,
AMERICAN DISTRICT TELEGRAPH CO.,
New York, January 1st, 1874.

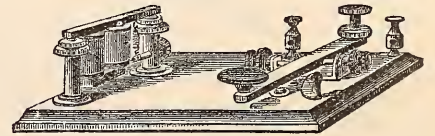
E. F. PHILLIPS, Esq.
Dear Sir: Your office wire is a decided success. We have used it exclusively for two years and consider it the best in the market.
Respectfully,
W. H. SAWYER, Gen' Sup't.

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FLEXIBLE CORDS, all kinds, &c., &c.

We warrant all Wire to be of the highest conductivity, tested by our Galvanometer, which compares with the tests of the highest authority in this country.

TILLOTSON'S EXCELSIOR
TELEGRAPH INSTRUMENT



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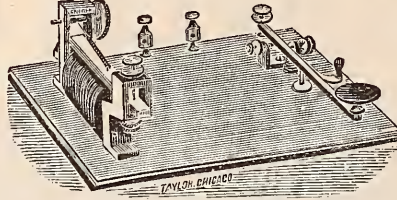
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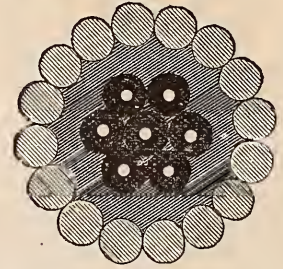
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, OCTOBER 3, 1874.

VOL. X. WHOLE No. 429.

My Last '73.

WELL, boys, I'm done with the business—
My fingers are stiff at last,
And I'll never jerk the lightning
Like I did in the days that's past.

My "battery" is lusted,
The "vitriol" all played out;
There's no more "local current"
Than you'll find in an old eave's spout.

My "magnets" have lost their power,
My "key" all covered with rust;
I hate to "cut out" forever,
But I must, for I can't adjust.

I've "pounded brass" for a livin'
Nigh onto forty years,
But the click of the "giant sounder"
Don't come to my weary ears.

I can't go back on "paper,"
For my sight begins to fail;
And I couldn't tell, to save me,
A "pole" from an old fence rail.

I feel the "relay" workin',
But cannot hear the sound,
I can't tell by these "patent fixins,"
The "cut out" from the "ground."

To-day the "circuit" lusted,
And I done my level best
At testin'; but, to save me,
Couldn't tell "east" from "west."

I tried to "screw up" for "X" to-day—
For I thought he was callin' me—
But with the magnets ridin' the armature,
I couldn't a worked with "B."

So, I says, old man it's comin',
You've surely had your day,
When you try to "adjust" by turnin'
The "screw" the other way.

So I wrote the train despatcher
That my day had come and gone;
If he had another man, I wished
He'd send him right along.

"On No. 3," he told me,
I can see the head lights shino.
So now I say good-bye to all
The "old boys" on the line.

Farewell! may Heaven bless you.
I can hardly hold the key;
Tears come when I try to say it,
My last long "73."

I. C. EDWARDS.

The Boston Industrial Exhibition.

The fair of the Massachusetts Charitable Mechanics' Association has been open at Boston for two or three weeks past, and is very complete and successful, as the exhibitions of this association always are. They are held but once in five years, and are a notable event in New England.

A correspondent sends THE TELEGRAPHER a brief account of the electrical and telegraphic instruments and apparatus on exhibition, which will be of interest. He writes that there is nothing especially new or interesting in the applications of electricity, unless we except the remarkable magneto-machine of Mr. Moses G. Farmer.

Mr. Charles T. Williams, the well known and long established manufacturer and dealer in electrical and telegraphic apparatus of 109 Court street, Boston, has a full line of telegraph apparatus on exhibition, which are very beautifully and substantially made, and highly finished with nickel plating. Mr. Williams has deservedly an excellent reputation as a manufacturer, and his contribution to the electrical department of the fair is highly creditable to him and the exhibition.

Mr. Thos. Hall exhibits his new portable battery for medical use, which is an improvement of Meyer's battery, and also a battery for galvano-caustic operations. He also exhibits a Ruhmkorff coil connected with a rotating Geissler tube, which is rotated by a very nicely constructed electro-magnetic engine, operated by the same battery that operates the coil. This apparatus can be used for illustrating the law of the persistence of vision, and when in operation will show a beautiful star of light.

Messrs. Jerome Redding & Co. exhibit some tele-

graph apparatus, electric bells etc., which are well made.

Messrs. Welch & Anders exhibit Anders' magneto-printer and magneto-dial instruments. The magneto-printer operates very efficiently and with considerable rapidity—as high as thirty words per minute being obtained on it.

The Gold and Stock Telegraph Company exhibit the celebrated Gray & Barton printer, and also a pair of the repeating instruments used in the business of the Company.

Mr. Edwin Holmes exhibits his well known and highly successful burglar alarm, which has been so generally introduced.

Another firm show many forms of the French annunciators and house telegraphs.

Press Telegraphing in Great Britain.—Inefficiency of the Postal Telegraph.

In the *New York Tribune*, G. W. S., its London correspondent, writes, under date of September 3d, in regard to telegraph matters in connection with the press as follows:

Of the curious views which some people who might know better entertain about journalism, a specimen has just turned up. I find in an important periodical two references to the report of Prof. Tyndall's address. It is described as occupying eight and a half columns of *The Times*, and every word of it, we are told, "was transmitted by telegraph at an immense cost to the leading journal." The telegraphic despatch is again mentioned in the same periodical as "one of the latest wonders of journalism, the cost of which, it is manifest, must have been enormous." I quote from *The Publishers' Circular*, which, concerning itself with practical matters touching literature of all sorts, ought to be better informed about the literature of journalism, and the expense of putting it in shape to be read. There is something ludicrous in the notion of enterprise and expenditure in getting Professor Tyndall's address. Whether the address was telegraphed at all may be doubted. It was in type in London some days before the meeting of the Association in Belfast. That copies were deposited with the principal journals of London may be inferred from the fact that one evening paper published extracts from the address some hours before it was delivered. It would be odd if no copy were sent to *The Times* office, or if their Belfast correspondent did not know that one had been sent, and so treated them to a telegraphic copy. Even in the latter case the expense would not cripple the paper. The actual cost which *The Publishers' Circular* speaks of as "immense" and "enormous" would be about nine pounds sterling, or \$50 in currency. I believe I have explained before that the English press gets its telegraphing done at very cheap rates. The ordinary rate for a telegram between any two places in the kingdom is one shilling for twenty words, addresses free. When the Government took over the telegraphs, a clause was put into the act securing to the newspapers the privilege of receiving one hundred words for one shilling. That is the price they now pay. In a *Times* column of solid minion there are about 2,100 words. If telegraphed, the column comes as near as possible to \$5. This is rather less than the \$2,100 gold we should have the pleasure of paying the Anglo-American Company for the same quantity of matter.

It is remarkable that the London papers, notwithstanding the cheapness of the inland telegraph, do not use it freely. One reason may be the inaccuracy of it, though special efforts are made to do good work for the papers. The meeting of the British Association is more fully reported by telegraph than most others, and a statement about it, either official or from official sources, has been published. The whole number of words transmitted during its six days' session to the English, Irish and Scotch press was 405,000. The cost is not mentioned—that would reduce the importance of the event too much—but the sum which the newspapers of the whole United Kingdom paid was a little over £200. I should say that *The Northern Whig* of Belfast spent just about the same amount for its extra reporting. The Post-office desires to have it understood that some of the wires between England and Ireland are out of order. There are 22 in all, contained in four cables, and seven out of the twenty-two were under repair. The remaining fifteen were asked to transmit on the busiest night of the meeting 80,000 words—and failed. The official account remarks that some portion—it does not say how much—of the matter telegraphed was "necessarily" too late for publication next morning. The sections adjourned at three in the afternoon, the papers go to press at four or later next morning, and, if the matter was reasonably handed in, one does not quite see the force of the "necessarily." Deducting two wires for the Anglo-American Company—of which they have the exclusive use between London and Valencia—there remain thirteen wires, which were asked on this one occasion to transmit less than 600 words each per hour, plus the ordinary business, and

"necessarily" failed. But the official apologist for the Department thinks that, having regard to its "vastly diminished resources," the work was "singularly well done."

Cuba Submarine Telegraph.

The directors in their report state that the gross receipts for the half year ending 30th June amount to £7,825, ordinary expenses to £1,930, leaving a balance of £5,895. The extraordinary expenditure for the repair of the cable has, however, amounted to £21,747, absorbing the whole of the balance of the reserve fund £12,283, the above balance of the half year's revenue £5,895, and leaving the sum of £3,567 to be carried forward to the debit of the current half year's account. They regret that the result is not more satisfactory. This is to be explained by the fact that the steamship Investigator, despatched by the Telegraph Construction and Maintenance Company in the beginning of December last year, took double the time to effect the repair to the cable that was anticipated, in this way doubling the cost of repair, and at the same time shortening the period during which the cable has been at work to about three months of the current half year. The receipts since the restoration of the cable have been satisfactory, and show a material increase on those of the corresponding period last year. The whole of the new capital authorized by special resolutions passed at the extraordinary general meeting of 12th of June last, was subscribed by the shareholders, and the contract for the new cable has been duly entered into with Messrs. Hooper's Company. The manufacture of that cable is now nearly completed, and the steamship Hooper is expected to sail in the beginning of next month to lay it. Instead, however, of landing the cable at Santiago de Cuba, it has been agreed, on the suggestion of the West India and Panama Company to carry it to Holland Bay, Jamaica, that company paying for the additional length required, but without thereby acquiring any property in the cable, which will remain the sole property of this company. By this arrangement, not only will a duplicate means of communication be provided over the whole of this company's system, but the extremely important section of the West India and Panama Company, between Cuba and Jamaica, will also be duplicated—an object of only greater importance to that company than it is to this. Arrangements are also in progress whereby it is believed the differences between this company and the West India Company will be brought to an amicable settlement, and a suitable vessel provided and stationed in the West Indies for the repair of both companies' cables. The cable of the Central American Company, referred to in the fifth paragraph of the special report submitted to the general meeting of 12th June last, has only been laid thus far from Para to Cayenne. The remaining section to Demerara is expected to be laid in November, and will then complete telegraphic communication between North and South America via the West Indies—a connection which, as previously stated, is expected to result in a very large increase of traffic to this company. Notwithstanding the diminished income for the working of the past year, owing to the length of time occupied in repairing the company's cable, the prospects of the company are better than at any former period. With duplicate lines of cable from England to the United States, thence as far as Trinidad (as will shortly be the case when the cable now in course of manufacture for the West India and Panama Company has been laid), and with the communication between South America and the West Indies established, there is every reason to believe that the company will be in a position to pay regular dividends to its shareholders, and, at the same time, lay aside a substantial sum to provide for any extraordinary repair or other contingency, which can never, under these circumstances, affect the prosperity of the company so seriously as it has done in the past.

A Telegraphic Blunder and What Came of It.

Mr. GIBSON, solicitor, writes to the *Times* that at the recent Assizes for Kent it became his duty to telegraph to a plaintiff and witnesses to attend the court on a particular day, and instructing them to travel by the "seven-thirty" train. The action was for breach of promise of marriage, and when the case was called on the plaintiff and her principal witness were absent. The case was so fortified by other evidence that counsel advised it should proceed, and the plaintiff obtained some damages, but not without strong and damaging observations by defendant's counsel upon the absence of the plaintiff and her family witnesses. A few minutes before the jury gave their verdict (about one o'clock) the plaintiff and her father came into court, and then produced a telegram directing them to travel by the "eleven-thirty" train—just four hours after the time appointed by my telegram. On inquiry it turns out that some one in the Post-office employ (elsewhere than at that town, though the

authorities do not say where) had made the gross blunder of writing "eleven" for "seven." The Post-office authorities write to me (says Mr. Gibson) and express their great regret, and assure me that they have taken "serious notice" of the blunder, the force and effect of which "serious notice" will be appreciated at once when I state that their letter is a lithographed form, the date only inserted in writing; from which I infer it to be obvious that discreditable mistakes are of constant concurrence, and the alleged "serious notice" a mere courteous expression, utterly without meaning or result. One of the jurymen, after the trial, was heard to say that they should have given nearly double the damages if the plaintiff and her father had been called. A telegraph company would have been liable to pay damages; but where is the remedy against the Post-office?—Dublin Freeman, Aug. 15.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AN INCLUDING SEPTEMBER 25, 1874.

ASSESSMENT NO. 66.

- 22, 26, 31, 37, 70, 76, 82, 84, 100, 101, 120, 143, 154, 156, 158, 160, 164, 171, 189, 190, 191, 193, 197, 206, 218, 220, 227, 230, 248, 252, 254, 280, 288, 316, 323, 341, 350, 353, 357, 362, 364, 366, 378, 380, 382, 394, 402, 411, 412, 418, 441, 447, 466, 468, 469, 470, 471, 475, 476, 482, 484, 511, 512, 514, 556, 557, 560, 569, 573, 574, 575, 584, 586, 587, 590, 600, 603, 605, 642, 646, 648, 649, 655, 656, 662, 663, 664, 665, 669, 691, 701, 708, 710, 712, 714, 717, 723, 724, 728, 742, 772, 780, 781, 782, 783, 785, 786, 790, 802, 809, 812, 813, 820, 823, 836, 838, 842, 870, 875, 876, 897, 904, 905, 906, 926, 930, 931, 938, 942, 944, 949, 954, 957, 959, 963, 964, 876, 979, 980, 1000, 1001, 1002, 1005, 1014, 1016, 1023, 1030, 1031, 1033, 1034, 1041, 1046, 1050, 1057, 1063, 1076, 1080, 1093, 1100, 1101, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1122, 1123, 1125, 1131, 1139, 1141, 1149, 1152, 1155, 1156, 1157, 1159, 1160, 1162, 1164, 1185, 1190, 1191, 1195, 1207, 1208, 1210, 1211, 1217, 1221, 1226, 1227, 1233, 1234, 1237, 1238, 1245, 1248, 1255, 1256, 1260, 1263, 129, 1270, 1281, 1283, 1284, 1285, 1286, 1288, 1290, 1294, 1339, 1340, 1342, 1344, 1346, 1848, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1358, 1359, 1364, 1365, 1366, 1375, 1376, 1405, 1406, 1407, 1415, 1417, 1418, 1426, 1427, 1430, 1432, 1433, 1444, 1448, 1449, 1451, 1454, 1455, 1456, 1457, 1458, 1465, 1469, 1471, 1474, 1475, 1476, 1481, 1483, 1497, 1498, 1503, 1505, 1506, 1507, 1513, 1517, 1518, 1524, 1528, 1529, 1530, 1532, 1542, 1546, 1558, 1560, 1563, 1564, 1572, 1573, 1586, 1589, 1590, 1596, 1697, 1609, 1616, 1619, 1630, 1635, 1644, 1649, 1652, 1556, 1660, 1661, 1662, 1663, 1665, 1666, 1667, 1673, 1676, 1681, 1684, 1687, 1988, 1696, 1699, 1700, 1701, 1702, 1804, 1709, 1710, 1713, 1814, 1718, 1723, 1724, 1729, 1733, 1737, 1746, 1747, 1750, 1751, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1763, 1765, 1766, 1767, 1868, 1769, 1771, 1773, 1775, 1885, 1788, 1889, 1799, 1802, 1809, 1811, 1812, 1813, 1827, 1828, 1830, 1837, 1838, 1839, 1840, 1841, 1844, 1845, 1857, 1859, 1860, 1863, 1864, 1876, 1877, 1879, 1895, 1896, 1903, 1907, 1915, 1916, 1917, 1922, 1924, 1926, 1942, 1943, 1958, 1972, 1073, 1986, 1991, 1992, 1993, 1996, 1997, 2004, 2007, 2010, 2012, 2015, 2022, 2023, 2026, 2028, 2033, 2035, 2041, 2045, 2050, 2053, 2057, 2061, 2065, 2072, 2074, 2075, 2085, 2092, 2094, 2101, 2108, 2109, 2110, 2112, 2120, 2128, 2131, 2133, 2134, 2136, 2141, 2142, 2143, 2145, 2147, 2154, 2156, 2159, 2165, 2166, 2167, 2168, 2170, 2171, 2180, 2181, 2183, 3184, 2185, 1187, 2192, 2198, 2200, 1203, 2204, 2205, 2206, 2210, 2211, 2217, 2218, 2220, 2225, 2227, 2230, 2231, 2233, 2234, 2238, 2244, 2145, 2246, 2248, 2249, 2250, 2252, 2253, 2254, 2256, 2258, 2260.

ASSESSMENT NO. 68.

- 4, 16, 23, 28, 37, 46, 52, 53, 54, 58, 60, 64, 74, 75, 77, 86, 91, 93, 95, 113, 122, 131, 140, 145, 157, 188, 208, 211, 217, 245, 269, 277, 289, 301, 302, 312, 316, 349, 352, 361, 372, 383, 385, 405, 426, 464, 467, 509, 532, 536, 542, 546, 547, 553, 555, 564, 579, 615, 626, 646, 659, 685, 714, 715, 721, 729, 731, 734, 740, 742, 769, 815, 821, 825, 732, 858, 859, 873, 875, 880, 912, 917, 923, 932, 941, 991, 992, 1001, 1013, 1039, 1047, 1054, 1061, 1088, 1090, 1126, 1243, 1147, 1148, 1175, 1178, 1183, 1199, 1208, 1226, 1227, 1232, 1259, 1282, 1298, 1300, 1306, 1325, 1345, 1357, 1402, 1403, 1404, 1409, 1410, 1484, 1488, 1489, 1517, 1532, 1554, 1555, 1568, 1571, 1589, 1591, 1672, 1676, 1681, 1708, 1723, 1735, 1783, 1775, 1852, 1894, 1900, 1901, 1919, 1944, 1950, 1951, 1957, 1965, 1991, 2019, 2021, 2025, 2027, 2030, 2049, 2082, 2089, 2097, 2103, 2113, 2135, 2138, 2164, 2169, 2174, 2175, 2178, 2190, 2197, 2199, 2201, 2213, 2228, 2229, 2239, 2240, 2257, 2259, 2263, 2269, 2274, 2287, 2289, 2291, 2299, 2300, 2301, 2302.

ASSESSMENT NO. 67.

- 2, 15, 17, 29, 97, 98, 319, 447, 565, 916, 1024, 1074,

- 1154, 1169, 1205, 1276, 1527, 1881, 1915, 2237, 2242, 2271, 2272, 2273, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2288, 2290, 2292, 2293, 2294, 2295, 2296, 2297, 2298.

ASSESSMENT NO. 65

438, 1798, 2070.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice that an acknowledgment of the receipt of one assessment should be taken as a receipt of all previous assessments.

A New Invention in Telegraphy.

THE Frankfurter Zeitung announces that an official in the Bavarian telegraph service has succeeded in making an apparatus which, if found to be of practical utility, may effect a revolution in the present system of telegraphy. The name of this gentleman is H. Becker, and the apparatus he has constructed, and to which he has given the name of "Electro-magnetic Copying Machine," appears to be a perfecting and improvement of Caselli's invention. The proprietorship of the apparatus has already been purchased by the banking firm of Messrs. Oppenheim & Weill, of Frankfort. Without any assistance from the operator it gives a fac simile of the original manuscript telegram in whatever language written—signatures, portraits, music, plans, etc., conveyed telegraphically to any distance, and in such admirable perfection that in comparing the original with the copy scarcely any difference can be discovered. "We, ourselves" says the above named journal, "witnessed the transfer from one apparatus to another not only of the lines of welcome issued by the Committee of the Musical Festival recently held in this city, profusely ornamented with instruments, wreaths of laurel and oak leaves, as well as symbolical arabesques, but also of bills of exchange filled up and signed, state despatches in cipher, telegrams written in Greek and Hebrew character, police notices with the portrait of the person wanted, military maps, such as a general might send to his subordinates to explain the situation described or mentioned in his written despatches and orders, together with the usual service communications as telegraphed from one station to another. All objects intended for transmission by this apparatus are written or drawn with prepared ink on silver paper, which is then placed on a revolving cylinder, and then telegraphed off to its destination, where it is received on clean tissue paper, and reproduced with most wonderful exactness."

Correspondence.

We do not hold ourselves responsible for the opinions of our correspondents. Our columns are open to free discussion on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Automatic Telegraphy.

TO THE EDITOR OF THE TELEGRAPHER.

MR. GEORGE B. PRESCOTT, electrician of the Western Union Telegraph Company, having now thrice repeated his antagonistic papers on Automatic Telegraphy, I think it would not be out of place to reply to each statement in the following extracts from his oft repeated article; and I would here observe that in so doing I am actuated solely by the most kindly feelings towards my scientific friend, and wish the same to be taken by him as an act of "brotherly distinction":

[From the Scientific American of Nov. 5, 1870.]

AUTOMATIC TELEGRAPHY. BY GEORGE B. PRESCOTT.

"In a recent series of carefully conducted experiments with the automatic system in which chemically prepared paper of a very sensitive nature was employed, I found that the highest rate of speed attainable through 500 miles of No. 8 iron wire did not exceed the ordinary rate of transmission by the Morse apparatus, and that the greatest speed which could be attained over a telegraph line of 250 miles in length composed of No 8 iron wire was 100 words per minute. When the speed of the instrument was increased beyond this rate the signals were prolonged so as to run into each other and become unintelligible."

"I wish you a happy new year." We could not get as many as seventy words per minute that were legible, * * * This was the best wire cast of New York. * * * Extract from the report of an eminent eastern scientist who conducted and assisted, as aforesaid, in a recent series of carefully conducted experiments with the automatic system in which chemically prepared paper of a very sensitive nature was employed. * * *

* * * Boston, January 2, 1871, and in my presence attested January 10, 1871.

From the Scientific American, Nov. 5, 1870, republished in Journal of the Telegraph, Sept. 15, 1874:

"In a recent series of carefully conducted experiments with the automatic system in which chemically prepared paper of a very sensitive nature was employed, I found that the highest rate of speed attainable through 500 miles of No. 8 iron wire did not exceed the ordinary rate of transmission by the Morse apparatus; that the greatest speed which could be attained over a telegraph line of 250 miles in length composed of No. 8 iron wire was 100 words per minute. When the speed of the instrument was increased beyond this rate the signals were prolonged so as to run into each other and become unintelligible."

The distinguished editor of the Scientific American, attended by his able scientific editor, Mr. F. Allen, on September 15, 1870, assisted in some experiments with my American automatic system, and received from Washington to New York six hundred and fifty words in sixty-six seconds. Again, on September 22, 1870, Mr. A. E. Beach, his son, Mr. F. C. Beach and Mr. Allen, again assisted in the reception of automatic despatches from Washington to New York—and in their issue of October 15, 1870, says the paragraph as going the round of the press, stating that the Little system of transmitting telegraph messages from Washington to New York, is correct in that statement. We have ourselves been lately investigating this system, and have a message of about six hundred words per minute, and distinctly legible.

From the Scientific American, Nov. 5, 1870, republished in The Operator, presumed to be a sub-organ, Sept. 15, 1874:

"In a recent series of carefully conducted experiments with the automatic system in which chemically prepared paper of a very sensitive nature was employed, I found that the highest rate of speed attainable through 500 miles of No. 8 iron wire did not exceed the ordinary rate of transmission by the Morse apparatus; and that the greatest speed which could be attained over a telegraph line of 250 miles in length composed of No. 8 iron wire was 100 words per minute. When the speed of the instrument was increased beyond this rate the signals were prolonged so as to run into each other and become unintelligible."

Et Sequentia.

"In 1872 Mr. Orton asserted, before a Congressional Committee at Washington, that the wires and operators of the Western Union Company were capable of telegraphing upon an average only about ten words per minute. Mr. Orton now concedes that nearly 12,000 words can be and have been transmitted in distinct legible signals, in one instance in thirty-four and in another in twenty-two minutes, on about 300 miles of line by my system!"

"Actual work done in the presence of the Hon. John A. J. Cresswell, Postmaster General, and numerous other gentlemen, including Senators and Representatives in Congress, on the evening of December 11th, 1873, by my automatic system."

"This system is capable of a speed of from five hundred to eight hundred words per minute."

JNO. A. J. CRESSWELL, Postmaster General.

June 30, 1873."

In conclusion, it is very evident that the very carefully conducted experiments of Messrs. Prescott and Farmer, in the fall of 1870, was conducted on as Mr. Prescott says:

"The theory upon which most of the experiments in automatic telegraphy have apparently proceeded is that electricity has a definite and practically instantaneous velocity, irrespective of the medium through which it is transmitted, and that all that was necessary to insure the success of the system was to provide an apparatus by which despatches previously prepared could be rapidly transmitted and recorded by automatic machinery." A most erroneous theory.

GEORGE LITTLE, Cons. Elec.,

PASSAIC CITY, NEW JERSEY, U. S. A., Sept. 18, 1874.

Brooks' Patent Insulators not Liable to be Damaged by Lightning.

BROOKS' PATENT INSULATOR WORKS, } No. 22 South Twenty-first street, }

PHILADELPHIA, Sept. 29.

TO THE EDITOR OF THE TELEGRAPHER.

YOUR issue of the 19th instant contains the following in the letter of your Chicago correspondent:

"Previous to the great fire here all the wires of the Western Union Company in this city were strung on Brooks insulators," and I am informed by one in au

thority, who ought to know whereof he affirms, that the wires have never tested so satisfactorily since, from the fact that on repairs recently in the city, the 'Brooks' have not been used, for what reason I am unable to state. The Kenosha insulators have been used recently on repairs here in the city. An intelligent line repairer of my acquaintance, who has given insulation a good deal of thought, says the Brooks is the best insulator made, that although the first cost is much more than any other insulator its insulating properties are so vastly superior to any other he has used in his fifteen years' experience in line building and repairing that they are by far the cheapest insulator in the market. He makes one serious objection to them however, which Mr. Brooks might remedy. The objection is that the way they are now constructed lightning bursts up through them, destroying their insulating properties of course, and it passes through the insulator in such a manner that the defect cannot be noticed by a repairer unless he climbs each pole and examines each insulator. Not being an insulation man I do not suggest a remedy, but give the information for what it is worth. Several of the Burlington and Quincy and some of the Michigan Central Railroad wires are strung exclusively on Brooks' screw shank insulators, and give great satisfaction, working well in either wet or dry weather."

Your correspondent says, "The way they (the Brooks' insulators) are constructed the lightning bursts up through them, destroying their insulating properties, of course." Now I beg leave to say to your Chicago correspondent that lightning does nothing of the kind. Lightning does not injure them in any manner. There are ten thousand insulators of mine used outside of Chicago to one used in Chicago, and that complaint has come from Chicago alone. If one of these insulators is heated on a stove to a point above 240 degrees Fahrenheit, the outer iron case will burst, provided the insulator is set upon the hot stove bottom upwards, in a manner that the sulphur nearest the stove and at the top of the insulators, is first melted. Many of the Brooks insulators that have been subjected to the flames of the Chicago conflagrations have been burst from this cause—but lightning has had nothing to do with it—a pot or vessel of sulphur, when allowed to cool, and then melted or heated at the bottom first will burst the vessel on account of the expansion which takes place in the change, from a solid to a liquid state.

The fewer the number of wires upon a set of poles the greater are the disruptive effects of lightning. I have never seen a pole or insulators injured where there were as many as thirty wires. There were from thirty to sixty wires upon the poles in Chicago. The greater the number of wires the more is the charge divided and dissipated. I refer to ordinary insulators, but with the Brooks insulators a pole with but one wire is very seldom injured; as the number of wires are increased the disruptive effects of atmospheric discharges are proportionately decreased.

DAVID BROOKS.

The Chicago Industrial Exhibition.—No Telegraphic Apparatus Shown, and Why?

CHICAGO, ILL., Sept. 28.

TO THE EDITOR OF THE TELEGRAPHER.

IN regard to the Exposition in my communication dated Sept. 14th, I should have said, "nearly all the makers of telegraph machinery who were represented last year are (expected to be) on hand again this year" I was informed that such would be the case, and I was perfectly satisfied at the time that my informant had good reason to believe so. That they were mistaken in their conjectures is indeed only too true, as not a solitary exhibitor of telegraph machinery of any kind whatever is represented in the massive building. The only way this can be accounted for, to my mind, is the utter disregard exhibited by the managers of the exposition to make a class for such goods separate and distinct from "medical electrical apparatus." This was not done last year, despite the recommendation, by either yourself, editorially, or by a correspondent, in THE TELEGRAPHER at that time (in decanting on the same feature of the Cincinnati exhibition), which recommendation was brought to their notice. It is probable that parties manufacturing such goods being cognizant of the fact that no separate award for the best telegraph machinery would be made, thought it not worth the trouble or expense they would be obliged to incur in order to make a showing, and concluded not to exhibit. This may or may not be deplorable.

A majority of the telegraphers who have visited the exposition have expressed themselves very much dissatisfied; after wandering for hours through the building, at not finding anything in their line.

As a means of advertising their wares however, we are disposed to think that the Exposition is a very poor place to show off telegraph supplies, as very few who visit such places are in need of such articles. The columns

of THE TELEGRAPHER will be found to be a much better place to advertise such apparatus and supplies.

The Western Union Company is the only one represented in the building, and their office is very seldom kept open evenings. It is near the centre entrance to the building, in quite a conspicuous locality.

Our attention was called to a sign not far distant from the entrance, and near the W. U. office, of the Western Electric Company of Chicago, but on repairing thither we found nothing but three or four of Sholes & Glidden's type writers, which, we understand, the Western Electric have made arrangements to manufacture for the trade.

I do not wish any one to infer by my remarks that the Exposition is not a success in other respects outside of the electrical portion of it, and any of our brethren who can make it convenient to visit Chicago during the Exposition, will find it an amusing and instructive place to pass away a few hours.

The display of surgical instruments and electrical appliances of that order is not very large or varied. The dispensers of the fluid for ten cents a trial, are of course on hand, duping the "greenies," who are made to suppose that after once getting their nerves shook up with the electricity dispensed by professor so and so with the shocking machine, that they are henceforth free from all the ills that flesh is heir to. If they should by chance get hold of one of "Porter's Telegraph College" circulars next, they, no doubt, would suppose they knew enough of lightning jerking to begin the study of the mystic art immediately.

Several styles of electrical alarm bells on exhibition are quite novel. The most notable thing in the Exposition, however, that came to our notice showing the various uses that electricity is being put to in these modern times was a burglar alarm, whereby if a door was opened or a window raised, it fired off a pistol, lighted a lamp, and, of course, woke the occupants of the premises at the same time.

Telegraphers, of course, do not expect to find in a strictly telegraph paper a description of pumpkins and squashes at an exposition, the local papers of their different sections furnishing that information, so I will not attempt any further description of the show at this time.

One of our boys, who has seen both the Cincinnati and Chicago Expositions this year, says we are considerably behind that city as far as the Exposition is concerned. The Chicago building, however, is the handsomest of the two.

The Western Union office here has been recently thoroughly equipped with Howard & Co.'s Boston electrical clocks.

Mr. F. W. Jones has perfected an improved automatic attachment for the signal bell of the pneumatic Board of Trade tube, which, by the way, is quite novel. The ringing of the bell after the box arrived in the receiving drum had to be stopped formerly by opening the door and breaking the circuit by inserting the hand into the drum. The ringing is stopped now by simply opening the door.

Before closing, I want to refer to the sensible original article in your issue of the 19th of September, entitled "Industrial Exhibitions. Their uses and abuses, their advantages and their defects." It is one of the best articles on the subject I have ever read. Our industrial exhibition managers would do well to study it. OCCASIONAL.

The G. R. and I. R. M. Telegraph.

TO THE EDITOR OF THE TELEGRAPHER.

THIS line is a railroad telegraph line, and extends from Grand Rapids to Petoskey, Michigan, on the G. R. and I. Railroad. The Western Union is nowhere up in this country. As a general thing the operators on this line are a pretty good set. We are, however, as usual, favored with a few plugs, who are inclined to think that they know all about what is business. Owing to a kindness and long suffering rarely met with, on the part of our chief, we have managed to get along with them, as the other operators think if he can stand it they can.

Mr. John J. Drew is, or rather was, Chief Operator and Train Despatcher on the road, but has now left us, and "cut in" on a better line, having accepted the office, duty and responsibility of master of transportation. There is not an employe on the line but that heartily unites in wishing him success in his new position. He will, undoubtedly, in his present, as in former positions which he has filled, do himself credit.

Mr. C. C. Weatherton, formerly agent and operator at Sturgis, Mich., has accepted the position vacated by Mr. Drew. He has our best wishes for his success.

We have some good operators on this line. Mr. L. Fleming occasionally gives us a shake up on this end, although his regular circuit is the Grand Rapids Southern. He thinks he is lightning, and we won't dispute it with him, as he gives a hard tussle to any of us who endeavor to try a tilt with him. It is a light task for him, when pushed, to give the boys a chance to learn how to drive a quill rapidly by rushing them

at the rate of 50 to 55 words a minute. Through Mr. Fleming's efforts there has been lately organized a "Telegraphers' Mutual Benefit Association," for the purpose of affording practice in receiving and general work of the office. They meet twice a week for practice. Every operator is expected to be in his or her (we are not without some female operators) own office on these occasions, and from about 8:15 to 9 o'clock P. M. the time is taken up in practice for those who are not as proficient as they might be. This is the time we receive. After that hour F. "wades in," and I don't wish to express an opinion as to who does or who don't receive and make a clean copy, but should like to see just a few of the first copies of some of the old "lightning" operators. As far as I am concerned, I take a back seat when this commences.

We have some more pretty good operators that understand business. Mr. W. E. Drew asserts that he won't take a back seat. He is at present located at Upper Big Rapids, and will probably stay there, as (whisper this softly) he don't want to leave his "ma."

Mr. L. Harris manages matters at Maneelona. He is what the boys style a "queer cove," but then when you get him worked up he is fully up to business. He has travelled some, too, and came up here to get a rest.

Well, I can't tell you about all the operators, male and female, in detail, and rather think this will fill space enough for the present. There are quite a number of the operators who might receive honorable mention. Lower Big Rapids is under the care of Mr. L. G. Wooley, who is a good operator and a gentleman. Rockford is a ladies' office, Miss Kingsley gathering in the lightning for the benefit of all interested. Morley is similarly fortunate, Miss Spaulding officiating at that station.

Am not going to tell where your correspondent is, but he works a little when opportunity offers, and is not entirely unknown upon the wire. Expect to go further north pretty soon, and see what it looks like up there.

There is now in this division 193 miles of line, not including the Traverse City branch of 26 miles. If I should take my contemplated trip North I may tell you at some future time where I went, and how things appear in that section. OH N.

Information for the "Organ" upon Duplex Telegraphy.

MITCHELL, IOWA, Sept. 25.

TO THE EDITOR OF THE TELEGRAPHER.

IN response to the questions of the editor of the *Journal of the Telegraph*, in his issue of August 15th, regarding my duplex, would say, like Mr. Farmer (I quote from the above journal), "by adjusting the mechanical force of the spring so as to equal the attractive force of the magnet when acted upon by one battery," is the extent of my adjustment. I said in above issue, "outgoing current does not operate relay at that station," and not "does not affect it." I did not say "without adjustment," but did say "without any changing of adjustment above that required in the single working circuit."

I still claim a permanent adjustment or equation in the duplex arrangement; for the currents from both batteries, i.e., the one which alone does not operate relay and is never disconnected from main line, and the battery connected with sending key at "A," flow through the same relay, and the same main line which is never opened by operating, therefore both currents are subject to the same variations. His last assertion is totally incorrect, because none of the current from sending battery flows through relay there, the principle of which he admits when he says "were the line open this suggestion would be correct;" for, be main line open or closed, how can it affect the polarity of the opposing currents or batteries?

Truly, my "supposition is that when both batteries are connected to line no current will pass through the relay" from "M B," the sending battery, "for the reason that any tendency in the battery connected to relay to set up a current" with "M B" in short circuit, when sending key "A 3" is closed, "is balanced by the opposing current from the battery connected with the resistance coil." S. J. M. BEAR.

Miscellaneous.

A CHEAP GALVANIC BATTERY.—Mr. W. M. Symons proposes a cheap but convenient galvanic battery; each of the zinc plates was two inches square, and covered with fustian or other fabric, outside which thick copper wire was wound to form the other plate; the exciting liquid was weak chloride of zinc. Pairs of plates thus made could be arranged in series to form a battery to give out weak currents for a great length of time.

"The celebrated inventor, EDISON." (?) Oh!

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST OF THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

THE TELEGRAPHER is the only generally recognized and established representative of the

TELEGRAPHIC FRATERNITY

in the United States and the Dominion of Canada, and, as such, has long enjoyed the confidence and approval of the great body of the telegraphers. Every effort has been and will be made to not only maintain but increase its

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MORE THAN TEN YEARS,

having been enlarged from time to time, as its increasing patronage has warranted.

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INCREASE ITS CIRCULATION.

To give everybody a chance to

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J. N. ASHLEY,

P. O. Box, 5503.

Publisher.

The Policy, Creed and Practice of The Telegrapher.

MANY people appear to labor under the conviction that THE TELEGRAPHER is published mainly for the purpose of keeping up a warfare upon the Western Union Telegraph Company, and that we are constantly seeking for an opportunity to attack that mammoth telegraph corporation. Those who so believe have but a very inadequate idea of the true purpose and policy of this paper. We have endeavored time and again to explain, in a manner adapted to the comprehension of even the most obtuse reader, what the actual policy and purpose of this paper is. We have no special antagonism to any telegraph organization, corporation, line or combination; neither have we any special favoritism for any. We mean to pursue a perfectly independent, honest and fair course towards all; to blame whenever and wherever blame appears to us to be necessary, and to commend whenever commendation is deserved. We do not represent a telegraph company or combination but the telegraphic fraternity, and would not knowingly descend to injustice or unfairness even to advance their interest.

This misapprehension in regard to THE TELEGRAPHER has been caused very considerably by the foolish antagonism which has been manifested towards this paper by certain officials and employes of the Western Union Telegraph Company, who seem to imagine that the sun, moon and stars revolve around that corporation, and that it is only by its gracious permission that existence is possible outside the hallowed precincts of its offices. We have known some of the employes of that company who regarded with holy horror the audacity which would question the infallibility of its dicta upon any telegraphic or electrical subject, and who regarded as only fit to be cast into outer telegraphic darkness any person who shall dare to entertain, much less express an opinion or belief contrary to that held in official circles. All this is very childish and absurd, and it is to be hoped that the number of those who are thus affected may decrease until the class shall become extinct at no distant day.

There are others, and a good many of them, who consider it the duty of THE TELEGRAPHER to sustain, right or wrong, whatever may be done or proposed to be done by any company or line competing with the Western Union. Often have we had addressed to us personally and by communication the reproachful phrase "Why, ain't you the organ of the opposition?" To all such we have but one answer, whether friend or foe: By no means! This paper is not, and while it is under its present management shall not become an organ. We represent the interests of the telegraphic fraternity, but we are nobody's organ. We care no more for one telegraph company or combination than for another, and do not ask any favors of one more than another. THE TELEGRAPHER has room and welcome for all who have anything to present, or who may think they have, which it is important or desirable should be known. We do not, by any means, endorse everything which appears in its columns, but are not only willing but rejoice to afford space for all to ventilate their ideas, discoveries and opinions on electrical and telegraphic subjects, even if they proceed so far as to criticize the policy and management of any telegraph company or line. We do not desire or intend to do injustice to any one; and if we should do full justice to every one, we fear the outcries and denunciations of THE TELEGRAPHER in certain quarters would be even louder and more fierce than they have been hitherto.

That THE TELEGRAPHER has bitter enemies, and no inconsiderable number of them, we are proud to know. A newspaper that can be conducted in such a manner as to make no enemies is not worth keeping alive or reading for any length of time. We do not propose at any time to adopt or pursue a namby pamby Miss Nancyish policy. We have decided opinions upon most subjects and in regard to most individuals, and when proper and necessary do not intend to be backward or mealy mouthed in expressing them. We may be mistaken in these opinions, but they are, certainly,

such as we honestly entertain, and if we are wrong we are open to conviction.

We hate shams and humbugs, whether they are successful or not, and whenever it becomes necessary to expose them we intend to do so. And, above all, we hate and despise the pretended inventors who are forever making new and startling discoveries—which are, for the most part, either stolen from others or dug out of books where they have lain fallow, because they were not of sufficient importance or practicability to be worth bringing forward. One of these fellows we have frequently had the pleasure of exposing, and expect to have that pleasure renewed from time to time. Our readers will doubtless understand to whom we allude without the necessity of our calling his name. We can conceive of no meanness or moral degradation deeper than that of such a person. Any one having such characteristics should be ignominiously kicked out of any respectable telegraph office whenever he sets his foot in it, or dares to bring any of his spurious wares seeking for a market.

We do not desire to be understood as charging or asserting that all who attempt to introduce or obtain adoption of devices or inventions which are not new are either shams, humbugs or pretended inventors. It is a well known fact, of which the managers of telegraph lines and companies are constantly being reminded, that there is no end to the (supposed) wonderful and invaluable inventions and discoveries which are constantly being made, and which they are impertinent and urged to test and adopt. Nine out of ten of these at least are entirely worthless and impracticable, and a large proportion of them are not new. It does not follow, however, that in such cases deception is intended. On the contrary, most of these supposititious inventors and discoverers are self-deceived, and humbug and delude themselves much more than they do anybody else. It is a difficult matter, sometimes, for those in authority to decide upon applications to test supposed new inventions and discoveries, for possibly something of value may be rejected inadvertently. Consequently, much liberality is usually shown in making tests upon telegraph lines, and in this respect the Western Union Telegraph Company, from motives of policy no doubt, is, as we are informed, very liberal, and seldom refuses to any reputable person, and in some instances to those who are not reputable, an opportunity to demonstrate the value of their claims and assertions. For these self-deceived, and, in the end, usually bitterly disappointed individuals, we feel sincere commiseration, and would not knowingly add to their troubles and mortification by an unkind word or paragraph. It is only to the inventor sharps and confidence fraternity that we entertain personal hostility, and delight in exposing in the columns of THE TELEGRAPHER.

In conclusion, we desire once more to impress upon the minds of every reader of this paper two or three things upon which, notwithstanding what has been written and often repeated heretofore, there seems to be a misunderstanding on the part of many.

First.—THE TELEGRAPHER is not an organ.

Second.—It is not the object and purpose of the publication of this paper to maintain a constant, bitter and uninterrupted warfare upon the Western Union Telegraph Company.

Third.—THE TELEGRAPHER is the uncompromising enemy of all shams, humbugs and telegraphic frauds.

Fourth.—THE TELEGRAPHER is not subsidized by anybody except its subscribers and advertisers, and its only means of existence and support comes from them, and thus far has not failed.

Fifth.—While the editorial opinions and convictions of this paper are not for sale, its columns are always open for the discussion and presentation of any matter or thing interesting to the telegraphic fraternity, or of importance electrically or telegraphically.

Sixth.—These are our principles. If you like them, help, support the only independent telegraphic and electrical journal in this country. If you don't like them, of course we don't expect you to enlist under our banner, and while we pity we will not condemn.

A Deserved Promotion and Excellent Appointment.

It gives us pleasure to record in THE TELEGRAPHER the recent well deserved promotion of Mr. GERRITT SMITH, late senior chief operator in the Western Union main office in this city, who has been transferred from that position to be assistant electrician of the company. Mr. SMITH has been engaged in telegraphic pursuits from boyhood, and has made a creditable and honorable record in every position that he has filled. He is an electrician of no mean ability, having devoted himself to the study of electrical science from a love of such investigations, and with the determination to become proficient therein for its own sake.

Of a singularly quiet and unostentations character, he has won, not merely the esteem, but the love of those associated with him, and leaves them now for higher duties, much to their sorrow and regret at the separation. But few persons are so happily constituted as to move through life without making some enemies, and chief operators are not apt to be popular. In this respect, however, Mr. SMITH is more fortunate than the generality of mankind, and, if any person can look about him and see only friends, he is that person. Always pleasant, agreeable, dignified and honorable, he has won the esteem of his associates in New York as he did of others in New England years ago.

The position to which he has been promoted is one most congenial to his tastes, and he will, without doubt, do credit to himself and the company which he serves. While the loss is keenly felt in the operating room, there is no one there but that wishes him success, and entertains a lively interest in his future welfare and prosperity, in which his other friends fully concur. His is a promotion and appointment every way deserved and proper to be made.

Resignation and Appointment of Supt. Albany, N. Y., Fire Alarm Telegraph.

Mr. A. L. WHIPPLE, who has been Superintendent of the Fire Alarm Telegraph in Albany, N. Y., ever since its introduction there, has resigned, and Mr. WILLIAM J. CULL, the able and popular assistant, has been promoted to the Superintendency.

During the days of the old N. Y., Albany and Buffalo Telegraph Company no employé was better known than BILLY CULL. He then, as now, had hosts of friends, and we are sure that they will all be pleased to hear of his success. We congratulate the City of Albany upon having secured so efficient and faithful a man to oversee this important branch of their service.

The American Fire Alarm Telegraph.

Messrs. GAMEWELL & Co. are just completing the work of introducing their American Fire Alarm Telegraph in the City of Minneapolis, Minn., under contract with the municipality of that thriving city. They have also contracted with the City of Nashville, Tenn., and with Pawtucket, Rhode Island, for the construction of their Fire Alarm Telegraph in those places.

GAMEWELL & Co. have had the virtual control of this business for several years, and have given universal satisfaction to all with whom they have had dealings. Theirs is the only perfect and reliable system of fire alarm telegraph in the world, and no place of any importance can afford to be without the protection which it gives. Their automatic system is inexpensive in operation, and is adapted to and has already been introduced into many of the smaller cities and towns of the country. By their enterprise, honorable dealing, and the excellence of their work, they have fully earned the success which they enjoy.

Personals.

Mr. W. H. YOSTE, of Bucyrus, Ohio, has been appointed night operator at Canton, Ohio, Railroad office.

Mr. BRONSON C. KEELER has resigned his position at No. 145 Broadway, New York, and resumes his studies at the Michigan University, Ann Arbor, Mich.

Mr. J. M. MOFFATT has returned from Saratoga, and is working again at No. 145 Broadway, New York.

Mr. F. B. RAE, of No. 145 Broadway, New York, goes to Syracuse, N. Y., Western Union office.

Mr. ALBERT AYERS (Lightning Putsey), is working for the Western Union Company in New Orleans, vice Mr. WILLIAM WEST, who has become treasurer of the Globe Theatre.

The Telegraph.

By Cable.

NO LATER NEWS OF THE FARADAY.

LONDON, September 30.—No information concerning the whereabouts of the Direct United States cable steamer Faraday has been received later than that furnished by the captain of the steamship Algeria, who, upon his arrival at New York, on the 22d inst., from Liverpool, reported seeing, on the 15th inst., two steamers bound west, supposed to have been the Faraday and consort. When the Faraday started from Gravesend to commence the work of laying the cable she had a supply of coal on hand sufficient to last six weeks.

The Gold and Stock Telegraph Company.

At a meeting of the Directors of the Gold and Stock Telegraph Company, held at their office in this city, Thursday, September 24th, the following officers were re-elected for the ensuing year: President, Marshall Lefferts; Vice-President, Geo. B. Prescott; Secretary and Treasurer, Henry H. Ward. Executive Committee: Wm. Orton, Norvin Green, Jas. H. Bancker, Tracy R. Edson and Marshall Lefferts.

The company's earnings and expenses for the fiscal year, ending September 18, 1874, were:

From gold and stock instruments.....	\$140,000
Private line instruments.....	68,000
Private line instruments in country.....	32,000
Commercial news department, city.....	50,000
Commercial news department, country... ..	275,000
Snudry earnings.....	16,000

Gross earnings.....	\$581,000
Operating expenses.....	419,000

Net earnings.....\$162,000

During the last four years out of net earnings the company has expended on lines and instruments the following amounts:

1871.....	\$58,420	1874.....	\$142,270
1872.....	292,160		
1873.....	216,175	Total ..	\$709,725

A New Telegraph Line.

THE Cheyenne, Boulder and Denver Telegraph Company have completed their line from Denver to Cheyenne, and offices have been opened at Fort Collins, Longmont and Denver, Colorado. Additional offices will be opened soon. This line is worked in exclusive connection with the Atlantic and Pacific Telegraph Company.

Arrival of United States Direct Cable Operators.

MESSRS. HUGH OSBORNE, Frost and Gee, of the operating staff of the United States Direct Cable Company, have arrived in this city, and are temporarily located at the Astor House. The full operating staff of the Company for the stations in Nova Scotia and the United States have now arrived, and are awaiting the completion of the laying of the cable to enter upon the discharge of their duties.

The Marine Telegraph Fight.

IN reply to the circular of General Lefferts, the President of the Gold and Stock Telegraph Company, Mr. JOHN C. SMITH, Superintendent of the Merchants' Exchange and Newsroom, has issued a circular to their patrons and the public detailing their grievances from the Western Union and Gold and Stock Telegraph Companies, and the reasons which compelled them to build their own line to Sandy Hook.

The circular also announces that there is nearly ready for occupancy a very convenient general telegraph office, in connection with the Newsroom, which will be occupied respectively by the Atlantic and Pacific, the Franklin, the Southern and Atlantic and the Sandy Hook, Long Branch, Highlands and Quarantine Telegraph lines, all managed by experienced telegraphers.

The Central American Telegraphs.

THE telegraphic system which Mr. Stanley McNider has been engaged in constructing during the past three years, under contracts with the Salvadorian and Guate-

malan Governments, is rapidly approaching completion, and now puts the following places into electric communication with each other, viz:

SALVADOR.

Acajutla,	Izalco,
Ahuachapam,	Quesaltepeque,
Atiquizaya,	San Salvador,
Cojotepeque,	Sonsomate,
Chinameca,	Santa Ana,
Chalcutapa,	Santa Tecla,
Chalatenango,	San Vicente,
Isobasco,	San Miguel,
Jucuapa,	Sensuntepeque,
La Libertad,	Snehitito,
La Union,	Usulután,
Metapam,	Zacateculuco.
Opico,	

GUATEMALA.

Amititlan,	Guatemala,
Asuncion,	Jutipa,
Cuajiniquilapa,	Mita,
Esquintla,	San José de Guatemala.

The introduction of the telegraph met with much opposition from ignorant or interested parties in certain sections of these countries, but now that the benefits arising therefrom have become apparent to the masses, it is generally meeting with much favor.

A connection will be made with Mexico during the course of this year, which will place every village, town and city in Salvador and Guatemala in daily contact with the entire world.

It is understood that Mr. McNider has made a contract with Nicaragua for a complete telegraph system therein, upon which he expects to commence operations on the completion of his present undertaking with Guatemala. When Nicaragua is thus equipped, and the submarine cable (now being made) is laid from Panama to Peru the continents of North and South America will be connected by electricity—with the exception of a gap of about 400 miles between the southern boundary of Costa Rica and the city of Panama, which connection, it is to be hoped, will not remain wanting for any length of time. A scheme has been recently agitated to lay a cable off the Atlantic coast, from Aspinwall (Colon) to Port Limon, in Nicaragua. If this scheme should be carried out it would, in an indirect manner, complete the missing link alluded to.

It has been wisely observed that where the telegraphic system has been introduced in the Central American republics it has replaced revolutions and anarchy by peace and prosperity. The observation seems to be justified by facts, and it is to be hoped that it may ever continue thus. In the meantime we shall look forward with pleasure to the day when we can shake hands over the wires with our Central American and South American neighbors.

Foreign Telegraphic Notes.

THE West India and Panama Telegraph Company have at length got their system into such order that the "latest dates" show the time occupied between Demerara and London to be from forty-five minutes to three hours.

The traffic on the various submarine lines continues to be satisfactory; and it is understood that after the holidays the extension of the Globe Amalgamation will be carried out with vigor.

In Japan the company's repairing steamer is at present submerging cables for account of the Japanese Government for the purpose of connecting Nippon and Yesso.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended the 12th September, was 391,599, an increase on the corresponding week of last year of 19,579.

The steamer Great Northern is reported arrived at Pernambuco from Para to repair the Pernambuco-Bahia section of the Western and Brazilian cable.

Soundings for the Australian Cable.

THE result of the recent sounding by H. M. S. Challenger of the route for the laying of a telegraph cable between Sydney and Wellington, to connect with the lines to Europe, which the Australian and New Zealand Governments have long been negotiating, was most satisfactory. It is confidently expected that, on the information obtained, New Zealand will be telegraphically connected with Europe next summer.

The bottom was sand and mud, gradually shelving to a depth of 2,600 fathoms, at which it remained very evenly for a long distance, the temperature at this depth being thirty-three degrees, and at the surface

sixty-four degrees. At this point the soundings commenced getting less, and at the next was found to be 1,975 fathoms (temperature thirty-six degrees). Two days after this 1,100 fathoms was recorded, the temperature rising to thirty-six degrees. These indications of shallow water were not without cause, for on the second day they came unexpectedly into 400, 350, and, at last, only 275 fathoms. This was about 200 miles from land.

Owton A. Flye.—He Goes into the Country with his Family.

EARLY last week Mrs. Flye expressed a desire to visit her "Aunt Schonchin" in the country. I had never been out of the city in my life, and finding that Mrs. F. would need my assistance in managing the children, handling bandboxes, etc., I looked at it from a utilitarian standpoint, and concluded to accompany her. Now, a visit to the country, ordinarily speaking, involves nothing extraordinary; it is quite a commonplace affair; but in my place, attending circumstances served to convert it into something (to me) remarkable.

My spirits were dampened at the outset, when I surveyed with wondering awe the formidable array of boxes, bundles, etc., which were to be conveyed to the early train in the morning. I tried to convince Mrs. F. of the folly of this, by asking whether she intended visiting Europe before her return, but my argument was lost. "She wasn't going to leave valuables in the house to be burglarized out of it during a week's absence." I coincided—ten years of domestic experience has taught me to do it—and the valuables were shipped.

It might be in order here to show the nice discrimination displayed by Mrs. F. in the selection of articles for safe keeping. She took with her the "spring styles" in wearing apparel and left the silver in a promiscuous heap on the dining room table; she took with her a dozen novels "just out," and left the parlor carpet on a line in the yard; she took with her two trunk loads of children's clothing, and left the front door unlocked, to say nothing of several other precautionary measures, which were distracting enough. Aunt received us kindly, and stowed us away into the "spare room," which had such an air of cleanliness about it that I involuntarily shrank from defiling the neatness and purity of the place with my travel-stained appearance. The first day passed tolerably well, but the awful stillness of the country began to tell on me. I pined for noise; something to relieve the monotonous and oppressive quietude of the place. I tried to induce Uncle John to hitch up the thrashing machine for my benefit, but he declined, on the ground of insanity. It was a relief to go out where the hired man was ploughing, and hear him swear at the horses; I enjoyed this for a while, but it grew too severe and I left him. I judged from this man's painful language that ploughing must be nearly as exasperating as travelling with a family. I didn't say anything to my wife about it though.

After the third day it began to grow alarming. For the first time in my life the children's crying was a blessing to me; I gave them sly pinches when Mrs. F. was not looking, and when they shrieked with pain I lay back and closed my eyes in the very ecstasy of delight. I was sorry when they went to sleep.

Next day I went down to the meadow lot, and sat on a rail fence four hours watching the grass grow. Could see no improvement at the end of that time and withdrew. I went to the barn and shelled four or five hundred bushels of corn to kill time; watered the cattle every half hour in the day. Anything but the dreary monotony of seeing nothing, hearing nothing and doing nothing.

And when night came it was too quiet for me to go to sleep. Oh, how I longed for a fire alarm, an engine whistle, or an explosion of some kind to lull me to sleep. I got up and walked round the farm several times to tire myself into a sleeping condition. No use. After a week's loss of sleep, worry of mind and heavy inactivity, I began to manifest symptoms of acute mania, and my friends brought me home.

I had no idea there was so much melody in a tug whistle as I found when I got home; so much real music in a boiler shop. I enjoyed it. I positively refuse to go into the country again, unless there is a saw mill on the place, where I can take a little comfort. I think of going into the theatrical profession. I studied hard for a *debut* as gravedigger to Booth's Hamlet last week, but after five rehearsals I found the work too hard (physically) and resigned.

I want something easy. I'd try it as the ghost, but I'm too tangible altogether to make it a success.

OWTON A. FLYE,
In the Buffalo Express.

Born.

THRESHER.—At Saratoga Springs, N. Y., Sept. 24, 1874, to Mr. Ed. H. THRESHER, operator, Western Union, Buffalo, N. Y., office, a son.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

SEPT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
24	78½ 78½	.....	.....
25	78½ 79¼	.....	.....
26	79¼ 79¼	.....	.....
28	79¼ 80	.....	.....
29	78½ 79½	.....	.....
30	79¼ 80½	.....	.....

New Patents.

For the week ended Aug. 25, 1874, and bearing that date.

154,451.—TELEGRAPH INSULATORS.—Homer Brooke, New York, N. Y. [Filed Apr. 20, 1874.]

Cast of one piece of glass, with top lugs out of a direct line for clamping and holding the wire without the necessity of a tie wire.

1. As an article of manufacture, a telegraph-insulator made of a single piece of glass, provided upon its top with the projecting ears C C, and grooves a, for holding the wire thereon in a curved or cramped manner, all substantially as and for the purposes herein set forth.

2. A telegraph-insulator made of a single piece of glass, and provided with projections C C and circumferential groove b, substantially as and for the purposes set forth.

154,479.—DUPLIX TELEGRAPHS.—Chas. H. Haskins, Milwaukee Wis. [Filed Apr. 14, 1874.]

Uses polarized relay; coils so wound that current entering from either end goes round both coils in opposite directions, causing armature to be moved; current (sender's battery) entering between coils goes round coils in same direction, holding armature inactive. Condenser P in branch circuit connected directly with main line circuit, so that extra charges from line and from condenser pass over same wire in opposite directions.

1. The relay, composed of two separate cores wound with helices in such manner that a current will pass in opposite directions around said cores when said current enters said helices from either of the free ends, one of said free ends being connected to line and the other to ground, in combination with the permanent magnet armature and the Morse key connected to both helices, between said helices, substantially as specified.

2. The combination of the helices C C', the parallel cores provided with semi-circular prolongations C C', the polarized armatures B, shaft D, contact points e e', and the wire M, attached to the connection m, and the key K, substantially as specified.

3. The combination, with the relay, substantially as specified, of the condenser P and the Morse key K, connected, arranged, and operating essentially as specified.

154,520.—AUTOMATIC ELECTRIC COMMUTATORS.—William Robinson, Brooklyn, N. Y. [Filed July 18, 1873.]

One battery, through the operation of a magnet in its own circuit, either upon the closing or breaking of the circuit, switches itself out and another battery into circuit.

1. In combination with two galvanic batteries, an electromagnetic commutator, constructed substantially as described, placed in circuits partially common to both batteries, and operating to switch out one and switch in the other battery through the action of one of the batteries, substantially as and for the purposes set forth.

2. In combination with the electro-magnet; commutator having the described circuit connections, the rail sections A A', the one closing the circuit through the commutator, and thereby determining the battery to be connected to the other rail section, substantially as and for the purposes set forth.

For the week ended Sept. 1, 1874, and bearing that date.

154,588.—GALVANOMETERS.—Wm. E. Davis, Jersey City, N. J. [Filed Mar. 5, 1874.]

Coil made in shape of sphere or cylinder, so that needle is always equally affected.

A galvanometer coil, B, whose convolutions cross each other at the pole a, beneath the centre of the needle, substantially as described.

154,617.—INSULATING TELEGRAPH WIRES.—Thos. L. Reed, Providence, R. I., assignor of one half his right to Eugene F. Phillips, same place. [Filed Aug. 25, 1873.]

Protects outer insulating jacket by a layer of soluble glass between such jacket and the wire.

Fibrous material saturated with a solution of glass, interposed between the wire and the outer covering of paraffine, wax or rubber, substantially as and for the purpose specified.

For the week ended Sept. 8, 1874, and bearing that date.

154,788.—DISTRICT TELEGRAPH SIGNAL BOXES. Thomas A. Edison, Newark, N. J. [Filed May 11, 1874.]

Circuit breaking apparatus is segment of circle attached to pivoted lever provided with finger knob. Depressing knob elevates segment, which falls to normal position by gravity.

1. A signal apparatus, composed of a lever with a segmental circuit closing surface, a contact roller, a finger key and connections, substantially as set forth.

2. A circuit closing segment and a weight at the end of a lever, in combination with a circuit closer and connections, substantially as set forth.

3. A telegraphic alarm and signalling apparatus, formed of two or more levers with circuit closing surfaces contained within a box, with finger pieces outside said box; substantially as specified.

154,928.—ELECTRIC ANNUNCIATORS. Albert Storck and John Lennox, Cleveland, Ohio. [Filed Feb. 19, 1874.]

The combination, in an electric annunciator, of a name or number plate, an electro-magnet, and an armature, said armature or the core of the magnet being made of hardened iron, to hold the plate in view by the force of residual magnetism, substantially as and for the purpose described.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with IRON, consists in its LIGHTNESS relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.
ALANSON CARY, Treasurer,
No. 234 West 20th St.,
New York.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

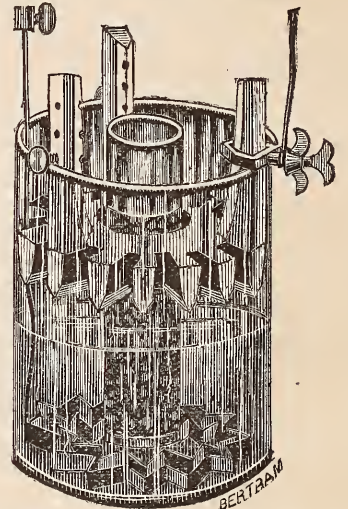
New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents.
UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

THE BALTIMORE BATTERY.



Acknowledged to be SUPERIOR to any other for Telegraph purposes.

Every comparative test made the past year resulted in the adoption of our Battery.

A prominent Superintendent writes: "My impression is the Baltimore is to be the Battery of the future." He has others in circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock reporting telegraphs, private lines. Superintendents fire alarm telegraphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

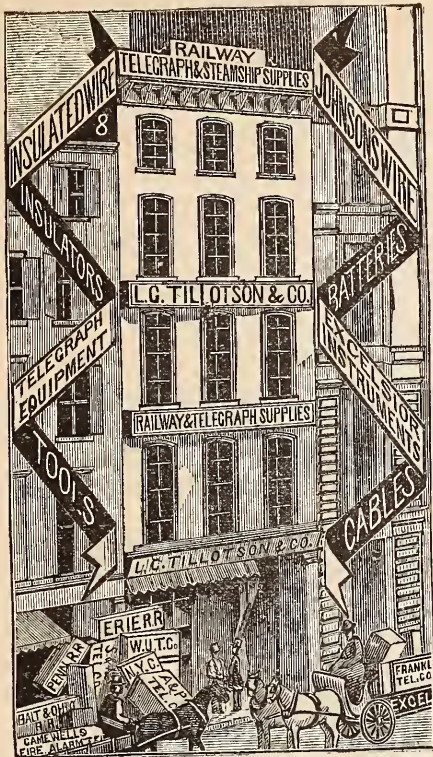
MESSAGE HOOK. \$5 PER 100.

For sale generally by

Dealers in Telegraph Goods. 75c. PER DOZ.



W. T. WESTBROOK,
WILMINGTON,
DELAWARE



BUY THE BEST.

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IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest

success of the times.

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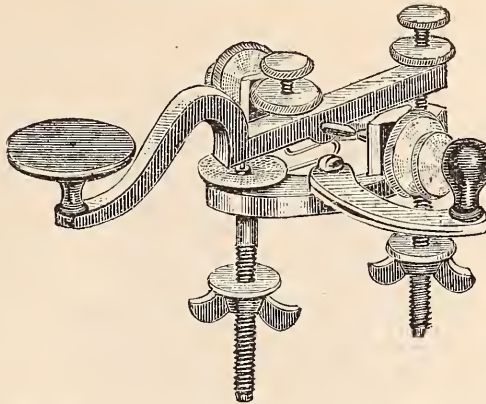
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PATENT CIRCUIT-CLOSER KEY.

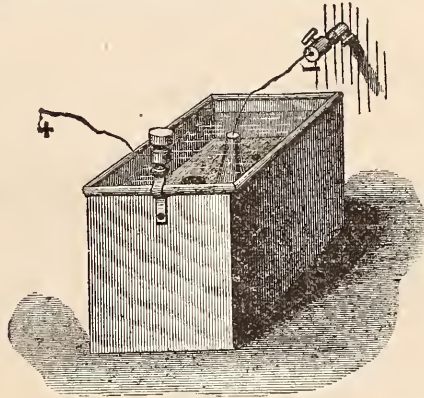
Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.

No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,
(P. O. Box 5603.) 38 VESEY STREET, N. Y.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.

RELAYS unequalled for beauty and strength.

GIANT SOUNDERS, without a rival for clear, loud sound.

STRAIGHT and CURVED LEVER KEYS, warranted not to stick.

REGISTER SPRING and WEIGHT, of approved patterns.

POCKET RELAYS, in Hard Rubber Cases; new style.

BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.

IMPROVED COMBINATION INSTRUMENTS for main line.

RELAY, SOUNDER and KEY on same base, making an elegant set.

WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.

HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.

WESTERN UNION (new style) SWITCH BOARDS.

ELECTRIC BELLS, single or vibrating stroke.

MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR

KIDDER'S MEDICAL APPARATUS,
JONES' LOCK SWITCH BOARDS,
HILL'S ANNUNCIATOR and FIRE ALARM,
PUTT'S MECHANICAL INSTRUMENTS,
UNITED STATES ELECTRIC GAS LIGHTING APPARATUS.
POPE'S RAILWAY SIGNALS,
SELDEN'S PRINTER,
ANDER'S MAGNETIC DIAL and PRINTER
GROVE, CARBON, BUNSEN, DANIELLS, LECLANCHE, LOCKWOOD, CALLAUD, SMEE and GRENET BATTERIES.

AGENTS FOR

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KERITE and GUTTA PERCHA WIRES and CABLES.

AGENTS FOR

MOORE & SONS' and PHILLIPS' MAGNETIC and OFFICE WIRES.

AGENTS FOR

ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK, and AWL CLIP.

AGENTS FOR

WASHBURN & MOEN'S celebrated GALVANIZED WIRE; also, AMERICAN COMPOUND WIRE.

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BROOKS' INSULATORS,
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VAUGHAN'S AUGURS and TOOLS in variety.

SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID the finest in the Market.

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SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,
Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH WITH A CENTRAL OFFICE,

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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

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Messrs. **GAMEWELL & CO.** are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by **MORE THAN TWENTY PATENTS.**

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has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

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but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THEIR CAN BE NO QUESTION.**

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of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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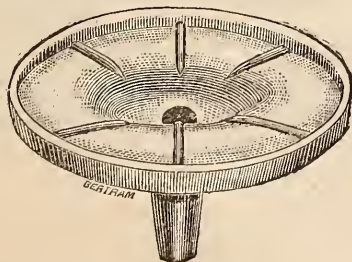
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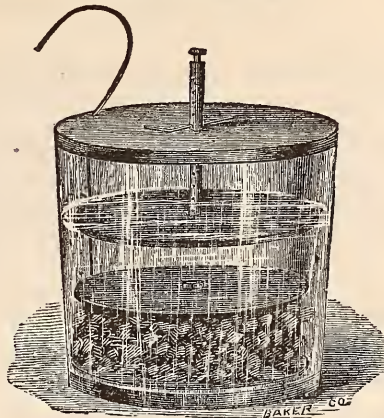
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THE
TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Crnikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

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Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

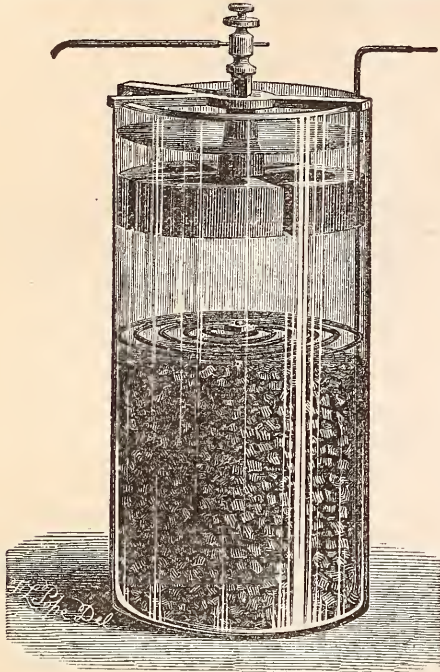
The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

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As the work progresses further notice will be given
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LOCKWOOD BATTERY,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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AT THE

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
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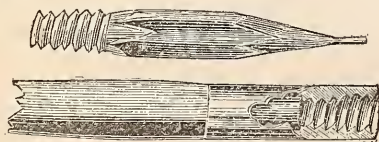
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This HOLDER is intended to save the last half or third of the pencil.

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Five years' operation have proved its merits.

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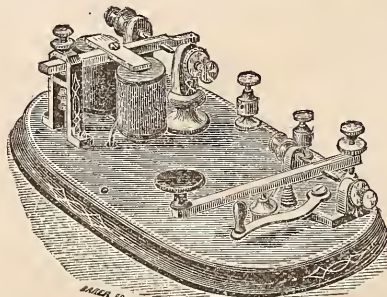
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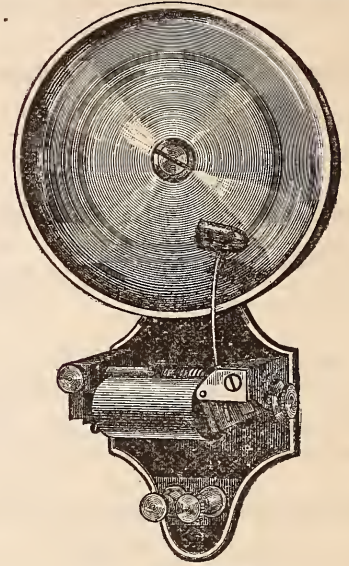
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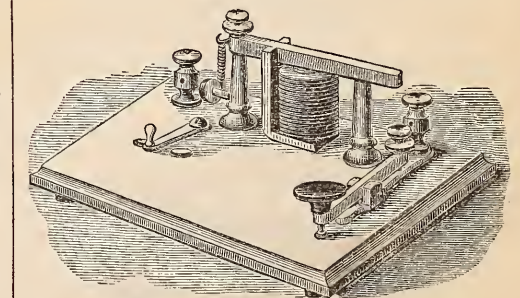
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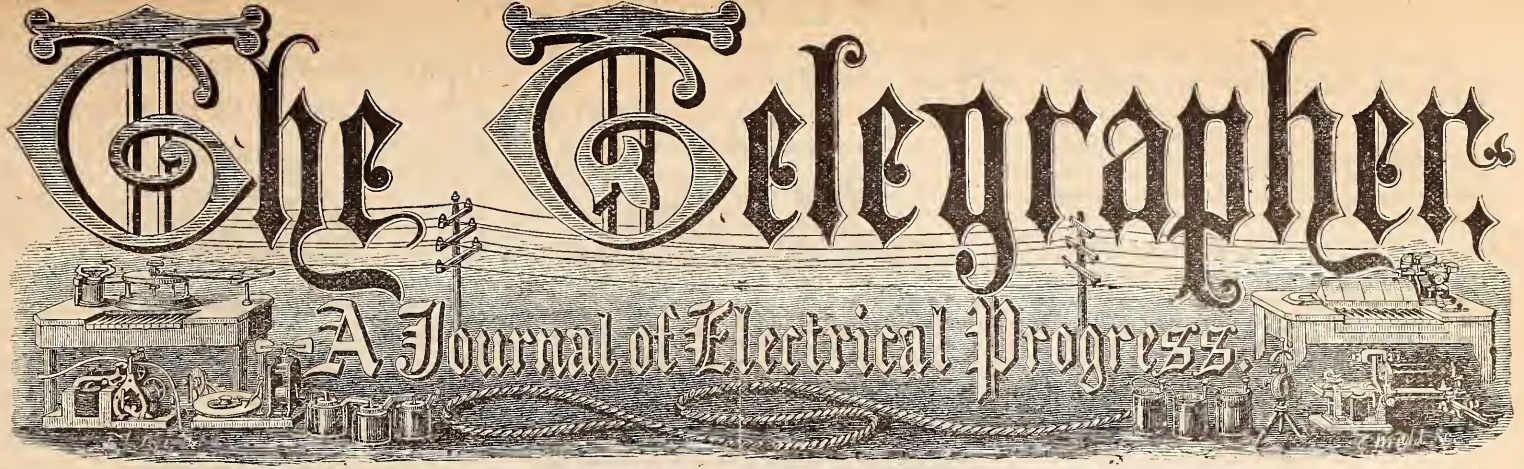
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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, October 10, 1874. Whole No. 430

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ELECTRIC CORDAGE,
which has been pronounced by all superior to any in the market.
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Phillips' Wire can be had of

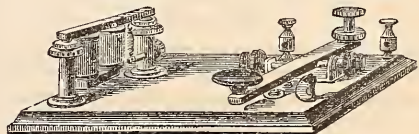
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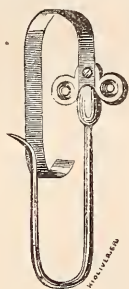
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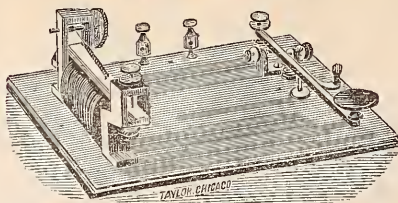
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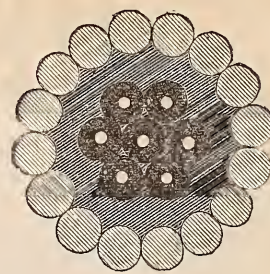
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, OCTOBER 10, 1874.

VOL. X. WHOLE No. 430.

Original Articles.

The Mystery of Electrical Communication.

WHATEVER is familiar to us becomes in a very short time commonplace, and is regarded as a matter of course, and it surprises us when we find that to others not so accustomed the same operation seems wonderful and mysterious. This is strikingly true in regard to communicating signals by electrical pulsations between places separated perhaps by hundreds and thousands of miles of space. To the telegrapher nothing seems more commonplace and less wonderful than that he should be able to converse with his fellow, however distant he may actually be from him. It is hut to touch a key and the thing is done. When, therefore, a stranger or one unaccustomed to electrical communication expresses wonder or surprise at what is to him matter of constant occurrence, it not unfrequently excites his mirth at the oddity of the expressions of amazement which it evokes. And yet, when we stop to consider the matter, we cannot but realize that, after all, the electric telegraph is a wonderful and wonder working and marvellous affair. What electricity is, is as much a mystery to us to-day as it ever has been. We know as little of its real character as the most ignorant boor who is struck with astonishment and incredulity at his first observation of actual telegraphic performance.

It is true that by diligent study and observation we have learned some of the laws which govern its manifestations, and have been able to utilize it for our service. We have learned how to develop it in such a manner as to furnish just what is required for our use and make it do our bidding, but this is all.

Electricity is undoubtedly one of the mightiest agencies in nature, and is all pervading throughout the universe. Yet we are still ignorant of its purpose and part in the great economy of nature. We witness its corruscations in the heavens in the magnificent displays of the aurora borealis, and the sympathetic responses upon electrical conductors connected with the earth; we recognize its might as it rends the heavens in its passage from one thunder cloud to another, and tremble at its terrible effects as it is transmitted from the clouds to the earth, rending, burning and destroying whatever may obstruct it. Yet we know not what it is, and the mystery is as great to us as it has been to those who have preceded us during the millions of years which have elapsed since the earth became habitable and inhabited. Like the principle of life, which has eluded the attempts of the wisest, most studious and persistent investigators, electricity appears to be utterly incomprehensible to the human mind. It has been by some philosophers believed that electricity and life were synonymous, and that as one cannot exist without the other, electricity must be the great principle of life itself, but this belief has never had many adherents, and there can scarcely be found at the present day any intelligent person who entertains it.

While it may not profit us to expend time and study upon these abstract, and to finite minds apparently insolvable questions of life and electricity, yet it may be worth while to pause for a time in our accustomed daily routine of telegraphic service to consider the great mystery which is constantly transpiring under our observation—so constantly that we are apt to regard it as no mystery at all. It is indeed wonderful that we should be able to communicate, by intelligible signs and symbols, through the slender metallic cord which passes not only over forests, deserts and mountains upon land, but for thousands of miles through the trackless depths of oceans. And not only can we thus communicate by signs and symbols, but can produce the exact *fac simile*, of the marks and symbols which are to be transmitted if it is desired to do so. It would seem as though the inventive genius of man must have nearly reached its limit when this has been accomplished, but it is impossible to predict what may or may not be accomplished in the future.

This mystery of electrical communication is ever new and wonderful, and that it is so we may realize when persons not familiar with it, as are most of the readers of THE TELEGRAPHER, are brought into personal observation of it. Most appropriate was the motto first transmitted over the experimental line

between Baltimore and Washington, "What hath God wrought?" for it would seem as if nothing less than omnipotent and omnipresent power, manifested in the electric current, could accomplish such marvels as were then and have been since developed in the electric telegraph.

The Telegraph Cable Operators.

THE telegraph cable operators form a class by themselves, requiring a special education and special adaptability to the service. Their life must be anything but a cheerful or social one, for they are located usually in out of the way places on the sea coast, where neighbors, if there are any, must be few and far between, and scarcely of a character calculated to constitute an interesting and pleasant social circle.

When on duty they are closely occupied in watching and translating the slender point of light whose vibrations convey to the eye with them, as sound does to the ear of the ordinary telegraph operator, the intelligence which it is necessary to communicate. When off duty their pleasures and recreations must be few indeed, and taken altogether the occupation and its surroundings are not such as would appear to be very enticing to individuals of social and companionable proclivities.

It may be said on the other hand, however, that the labor required is not excessive, and is understood to be pretty well paid, and if there is a lack of opportunity for social enjoyment, there is also not much temptation to spend money, and that the position of cable operator is one in which there is an opportunity for financial accumulation. Most, if not all, of the cable operators on this side of the big pond came from England, and after a certain term of service they are entitled to a three months' leave of absence to visit their native land, if they so desire, and receive from the company a liberal allowance to defray their expenses upon the trip.

It will be seen, therefore, that in this as in most other kinds of business, advantages and disadvantages are both found, and, perhaps, on the whole, our cable telegraphic brethren may not consider that theirs is the least desirable position in the telegraph service.

Proceedings of the Chicago District of the Telegraphers' Mutual Benefit Association.

CHICAGO, ILL., Oct. 4th.

THE members of "The Telegraphers' Mutual Benefit Association" of the Chicago district held a meeting in the Gold and Stock rooms at ten o'clock this morning. The following members were present: C. Sweede, F. M. Crittenton, W. A. Leary, O. W. Hamilton, F. N. Benson, F. W. Jones (agent), E. Lomasney and W. C. Long.

On motion of F. W. Jones, agent, the meeting was called to order by the appointment of W. C. Long as Chairman, and on motion of F. M. Crittenton, Mr. E. Lomasney was requested to act as secretary.

Considerable talk was indulged in by the members present in regard to the object of this meeting, and as to what instructions should be given our delegate to the annual meeting of our association in New York City, on the eleventh of November next, which assumed tangible shape by the offering of the following preamble and resolutions by F. W. Jones, seconded by Mr. F. M. Crittenton.

Resolved, That our delegate to the annual convention, to be held in the City of New York eleventh of November next, be, and is hereby authorized to work for an amendment to that article of the constitution which debar delinquent members from being reinstated without paying up all back dues, etc., etc., as follows:

That delinquent members desiring to be reinstated who are in arrears over sixty days and under one year, shall be required to file an application for restoration to membership, and pay up all back dues: but after this time, in consideration of delinquent members incurring such great risks as they do by allowing themselves to become delinquent (it not being our province to inquire into the cause therefor) for one year or over, and who desire to be restored to membership, shall only be required to file the same application, furnish the same certificate and pay the same fees as new members; not being required to pay up all back dues as heretofore.

After considerable friendly discussion by the gentlemen present the resolution was unanimously adopted.

Mr. W. A. Leary then offered the following resolution, which was seconded by Mr. O. W. Hamilton, and without any discussion was passed unanimously.

Resolved, That it is our belief that many members who have become delinquent more than one year who are in good standing and desirable would again join our ranks did they fully understand the terms and conditions of the above resolution. That we suggest all such delinquent names be selected from the books of the association at New York, and a copy of these resolutions, if adopted by the annual meeting on the 11th

of November next, be sent them for their consideration, believing that the interests of this Association will be advanced thereby.

The chairman stated that the next thing to be considered was the appointment of a delegate to the convention, mentioned heretofore. Thereupon Mr. O. W. Hamilton moved and Mr. E. Lomasney seconded the motion that Mr. F. W. Jones, the present agent of the Chicago district of the association, be, and is hereby appointed as delegate to the said convention.

An animated discussion then arose, which, however, was a one sided affair, the only opposing element being Mr. Jones himself, who suggested the name of Mr. C. H. Summers, one of the oldest members of the association. Mr. Jones remarked that he had tried to induce Mr. Summers to promise that he would act as delegate if elected; that Mr. Summers had expressed himself as not being positive that he would be able to attend the convention, and that he (Mr. Jones) was not positive that he himself would be able to attend either, and begged leave to offer as an amendment the name of Mr. C. H. Summers as delegate.

The other members present, although having implicit confidence in Mr. Summers, declared that they had made up their minds that Mr. Jones should represent them as their delegate, he having served them in the capacity of agent for so long a time and so faithfully that they were positive that no one better understood their sentiments, and could so ably represent them as he could.

Mr. Jones wished the members to understand that it was not because he was not willing to serve the members of this district in this as in any other capacity possible. If elected he would promise to lay aside all views of his own in this matter, and faithfully represent the members of this district; but as far as his knowledge went of the views of the members of this district he had found no views of his own at variance with the views of any member of the district.

A vote was then taken, which was participated in by every member present (including the chairman, who called Mr. Benson to the chair while he recorded his vote) excepting Mr. Jones. The vote was, therefore, ordered to be recorded as a unanimous vote.

It was then suggested by the chairman that provision be made for an alternate delegate, when Mr. F. N. Benson, seconded by Mr. W. A. Leary, offered the following:

"That in case Mr. Jones should, from any reason whatever, find it impossible to attend the annual meeting, that he be empowered to appoint a substitute."

Passed unanimously.

On motion of W. A. Leary, seconded by F. N. Benson, it was resolved that the expenses of our delegate to the annual meeting be borne equally by the members of this district. Passed unanimously.

On motion of O. W. Hamilton, seconded by Mr. C. Sweede, it was resolved that hereafter seven members shall constitute a quorum for the transaction of the business of the association of this district; and all business transacted by them shall be binding on all the members of the district.

The Chairman then remarked, as there was not many members of the district present at this meeting, it might become necessary to call another meeting—probably more than one before the departure of our delegate for the annual meeting in New York, so that a larger majority of the members of this district might give expression to their views, and adopt the proceedings of this meeting in whole or part, or make some alterations in the instructions to the delegate.

It was, therefore, moved by Mr. F. M. Crittenton and seconded by Mr. O. W. Hamilton, that, upon request of any seven members of this district, a meeting may be called at any time hereafter for the consideration of any further business, upon written application to the chairman or secretary of this meeting; and that the said chairman and secretary of this meeting be and are hereby constituted permanent officers until such meeting is called. Carried.

On motion of W. A. Leary, seconded by F. M. Crittenton, a vote of thanks was rendered to Col. J. J. S. Wilson, Superintendent, for the use of the Gold and Stock Rooms for our meeting to-day; and the secretary was authorized to notify Mr. Wilson of this action by the meeting.

It was then moved by F. W. Jones, seconded by W. A. Leary, that a copy of the minutes of this meeting, and all the resolutions adopted, be furnished to the *Journal of the Telegraph*, THE TELEGRAPHER, and *The Operator*, for publication. Carried.

Moved by Mr. Leary, seconded by Mr. O. W. Hamilton, that we adjourn. Carried.

Accordingly, the meeting was adjourned at one P. M. E. LOMASNEY, Secretary.

The directors of the Eastern Telegraph Company announce the payment, on the 14th October, of the usual interim dividend of 2s. 6d. per share, free of income tax, for the quarter ended June 30, 1874.

Farmer's Dynamo-Electric Machines.

THE following description of the Dynamo-Electric Machine, of Mr. Moses G. Farmer, now on exhibition at the Fair of the Massachusetts Charitable Mechanic Association, at Boston, to which reference was made in the last number of THE TELEGRAPHER, will be read with interest. Mr. Farmer's ability as a scientific electrician is well known not only in this country but throughout the civilized world, and he has made many important and valuable inventions in connection with electricity, to the study of which his life has mainly been devoted:

"As the visitor passes through the entrance from section eight to section nine he may perchance notice standing upon a rude shelf two square cases or boxes of polished wood, not so large or heavy but that any one could easily take either or both in his hands and carry them off. Although by no means formidable in appearance, not likely to attract the attention of the careless stroller through the halls, these innocent looking boxes are really most terrible engines of destruction; one of the simplest and at the same time one of the most ingenious inventions to be found in the exhibition. With this apparatus a child could, at a distance of eight miles, utterly annihilate, the largest and strongest war vessel that ever floated; or discharge a series of blasts which would rend and shiver thousands of tons of solid rock. In the fierce heat evolved the hardest metals melt and dissolve like frost-work before a glowing furnace, while the light produced surpasses in brilliancy and intensity that of any artificial illuminator known. This is the invention of Mr. Moses G. Farmer, who, twenty-two years ago, furnished this city with the admirable fire alarm which has since been so generally adopted in all the principal cities of this country. The largest machine, weighing but 115 pounds, is designed for firing torpedoes and discharging simultaneously a series of blasts in mines and quarries. This has been adopted by the United States Government for torpedo service, has been successfully used in the torpedo experiments recently made at Newport, R. I., and several of the same have been furnished the Government of the Argentine Republic. The smaller one, weighing sixty pounds, is adapted to firing blasts in mines, tunnels and quarries. No cumbersome batteries, with the disagreeable adjuncts of acids and other chemicals, are necessary, as the electric current is generated by electro-magnetism, and the machines are really as free from anything unsightly or objectionable in their appearance or working as a writing desk, or lady's workbox.

"Their merits, which are apparent to any one, are their compactness, the ease with which they can be operated, their cheapness and certainty of operation, each one being provided with a testing attachment, by which the operator can be absolutely sure of the result before touching the key which explodes the torpedo or the blast. The operation of generating the electricity is produced by means of the simplest mechanism—a crank. Back of these is another machine substantially of the same construction, a little over two feet square, weighing less than 700 pounds, and run by steam power. This is capable of producing the most intense light and heat known to scientific men. Some idea of the brilliancy of the light may be given those who have witnessed the experiments of Professor Tyndall, and kindred experiments at Harvard College and the Institute of Technology, when we state the fact that the most intense light shown there was of the capacity of from five hundred to seven hundred candles, while the measure of this is *six thousand candles!* Mr. Stowell, assistant to Mr. Farmer, a practical electrician, who has charge of the machines, further demonstrates its power by casting the shadow of the flame of a lighted candle in bright daylight. A gentleman, who saw the light as exhibited by Mr. Farmer at Newport, estimated that it was fully six times as powerful as one he saw in Paris, produced by a fifteen horse power machine weighing 7,000 pounds. This brilliant light is generated at less than one tenth the cost of the same amount from gas, and it is not improbable that in the future our streets, theatres and public buildings may be illuminated by this method. Another practical application to which this may be put is that of electroplating and electrotyping. A machine costing \$1,000, occupying scarcely any space, requiring no outlay for acids as do the batteries, will in two hours accomplish the same amount of work performed by the ordinary battery in twelve hours, while the cost is less than one fifth that of the usual method. Simple as the construction of the apparatus may appear to the ordinary observer, it represents the persistent labor and patient research of years, not to mention the large outlay made in experiments by the inventor, who has spent almost a lifetime in the endeavor to render more available in the service of science and mechanics the mighty forces of this mysterious agent."

"The teeming brain and untiring nerve of this great genius," meaning TOM EDISON!

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Reply to "Journal of the Telegraph" Criticisms on Bear's Duplex.

MITCHELL, IOWA, Sept. 26.

TO THE EDITOR OF THE TELEGRAPHER.

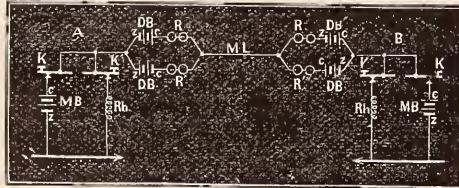
In the *Journal of the Telegraph* of the 15th inst., in the correspondence column, is this address to my name from the editor:

"We have tried your duplex devices and find them totally inoperative, for reasons already given in our articles on the subject, and we apprehend that if you will spend as much time in testing the question with a few cells of battery and a relay as you have in writing your objections to our criticism you won't feel disposed to argue the question any further. Why don't you obtain and publish the opinion of the editor of the paper who printed and illustrated your description of your apparatus as to its merits?"

I don't doubt in the least that he found them inoperative if he got as badly mixed in his experiment as he did in theory.

What good will my testing do if I cannot explain the result? And what benefit is it to ask questions he does not allow me to answer? As my answers to his former questions were not published, I will take his advice about spending so much time in writing a reply no longer than the questioning article. Ought he not to allow me the same weapon in defence that he attacks me with?

Mistakes were made in my diagrams which any honest investigator could perceive by comparing them with my descriptions, and were so evident that I did not care to correct but one. If he will give us a good reason for his failure in the trial of my devices, then some one may be benefited thereby.



This diagram represents my method for simultaneous communication between terminal offices, both communications in same or opposite directions, with common instruments. In this method the increased quantity of electricity from main batteries, over diverting batteries, operates the relays, they being adjusted so high as to overcome attraction of diverting current alone. The current from M B divides between M L and R in proportion to their respective resistances. Two like currents pass each other on same line in opposite directions, but as the diverting battery on one side presents a like pole of same potential the approaching current takes the other side which presents an opposite pole, as shown by arrows. When K' is opened all of current flows to line but its increased quantity may be neutralized in same manner as in my first published plan.

S. J. M. BEAR.

Chilly Weather.—Action of Chicago Members T. M. B. Association—Suggestions for Office Improvement and Ventilation.

CHICAGO, Oct. 5.

TO THE EDITOR OF THE TELEGRAPHER.

We are enjoying quite a cool snap in the way of weather just at present, and business has been a little dull of late.

The exposition still flourishes, although no telegraph machinery is upon exhibition yet, and from present indications none will be.

For some time past it has been known to the members belonging to this district of the *Telegrapher's Mutual Benefit Association* that on Sunday 10 A. M., the 4th of October, there would be a meeting held at the Gold and Stock Rooms in this city for the purpose of electing a delegate to the annual meeting of the association in New York, which takes place the 11th of next November; and also for the purpose of instructing the delegate as to the wishes of the members in this locality in regard to changes in the constitution. The subject of reinstating delinquent members has been a general topic of conversation among the members for some time, and it is to be hoped that some action will be taken at the meeting in New York which shall bring back all the good, healthy

delinquents now deprived of the benefits of the association. I understand that this meeting was held yesterday, and that although very few of the members were present, that those who were there manifested the greatest harmony of spirit.

Mr. F. W. Jones, the present agent of the association, was elected a delegate.

As I am reliably informed that a resolution was passed providing for the publication of the proceedings of the meeting in THE TELEGRAPHER and other telegraphic journals, I did not use any extra exertions to ascertain the result of the meeting farther than above stated.

I have often, in conversation with operators in the Western Union office, heard them express great dislike to the way the drawers were arranged in what is called the Western Union table. There is a drawer placed in each table just a little to the left of where each operator sits, and so near to the operator that when the check clerk gathers up the business, as they generally do every few hours in large offices, he is obliged to disturb the operator. It is claimed that one drawer just a trifle larger than the ones now used placed exactly between the two operators on one division of the table would be sufficient to hold the business, and would be accessible for the check clerks or any one else without necessitating the operators moving at all. This would require but half the number of drawers, *i. e.*, two on each side of the large eight instrument tables, or four drawers to one large table. Others have suggested to arrange the drawers for business this way, and then have an extra drawer for each operator directly in front of him provided with a lock and key in which to keep his pencils, pens, and any other small articles necessary.

By doing this, and making each operator thus furnished with a locked drawer responsible for these articles, no doubt a saving would be effected in one year that would pay for the extra expense more than double the cost. This would place six drawers on each side of a large table instead of as now only four. To those not accustomed to being troubled by being obliged to stop work for the check clerk this may seem a trifling matter, but those who have experienced this inconvenience, especially when a little hurried and been obliged to break for "that cust boy" (to make it mild as possible), it is a matter of considerable consequence; and if the tables in any new Western Union office hereafter fitted up shall contain the requisite improvements, we shall feel repaid for our "midnight oil" and toil in pointing out this defect; and you will have the pleasure of knowing that by your ventilating the subject you have saved some poor, tired telegraphers from unnecessary aggravation.

Propos of the chilly weather now upon us and the colder weather approaching, perhaps a few words on the subject of ventilating an office might not be out of place. as you are always ready and willing, I notice, to ventilate (that's no pun) anything for the good of the fraternity. It is generally the custom (and I am sorry to say our lady friends carry it to the extreme) to ventilate a room by raising the windows from the bottom, and I think I can clearly show that when windows reach all the way down to a level with the floor that this is a pernicious habit to say the least of it. In the first place, if the windows are raised from the bottom, and not far enough to be above the top of the heads of the occupants of the room, and there is no ventilation from above, all the foul air which has been expelled from the lungs of those in the room rises to the ceiling, the pure air from the outside rushes in from below and drives the impure air down to be again drawn into the tired lungs, which are starving as it were for pure, fresh air, and breathed over again; and if enough windows are hoisted to clear the room of all the impure air the result to weak lungs is very dangerous.

In the second place, if any of the occupants of the room are troubled with rheumatism at all (and this disease is generally manifested most violently in the lower limbs) the cold draft from below causes the feet and limbs to become chilled and cold, and stops or retards free circulation in that part of the body. This being the case the blood rushes back to the head, the brain is unduly excited, and besides a severe attack of the rheumatism brought on by the cold draught of air on the lower limbs, a severe headache sets in, and very frequently, on account of the upper part of the body becoming so heated, a heavy cold is taken in the chest, the lungs more or less affected, and, more than likely, the seeds of consumption are in this manner prematurely sown. The occupants of such a ventilated room, who, in the performance of their duties are obliged to be moving around on their feet, are not so materially affected as are those who are obliged to sit still for three or four hours at a time, without any chance to exercise their lower limbs. The proper way to ventilate a room in the summer is to let the windows down from the top to within a foot or eighteen inches of the head, and raise it just a little from the bottom. In very warm weather the observance of this rule is not so necessary, but in the spring

or fall of the year, when there is more or less chilliness and dampness in the air, the windows should never be allowed to remain raised from the bottom. When a person is seated for any length of time in the room, and only let down far enough from the top to keep the room supplied with pure air. If the room is thus ventilated the feelings of the occupants will inform them just how far and how long to let the window remain down; while, on the contrary, if raised from the bottom, there is no guide whatever, as the head will still be hot and feverish, while the feet and lower extremities of those in a sitting posture will ache from the cold.

I hope these suggestions will be carefully weighed, as I am certain that thereby a great deal of suffering will be avoided, and not so much red flannel adorning our lady friends' necks this fall and winter.

DOCTOR.

In the Wilds of Jersey.

TO THE EDITOR OF THE TELEGRAPHER.

THERE is not much going on, telegraphically speaking, in this part of Jersey, and, not being much of a writer, I hope your readers will excuse all shortcomings.

I shall try to give you a list of brass pounders in this region, commencing with "The New Jersey Midland Railway" telegraph lines. The operators on this road are a very nice class of fellows, though I admit some are very poor indeed. First, we will begin with our popular Superintendent, Mr. W. E. Lewis—"W. E.", who, as I understand, came from Elmira, N. Y. (N. C. R. R.), but later our chief and train despatcher. In my opinion, as well as a great many others, the company made a very good selection when they put him in as superintendent. We don't hear him on the wires quite as much as we used to, but he comes to the key occasionally to let the boys know he is alive. His headquarters are at Jersey City. Then next on the list comes that prince of good fellows—Mr. F. S. Gannon. "F. S." who makes both trains and operators stand around. All the boys like Frank first rate, but we hope he won't let that young lady up on the Erie take him from us.

Next comes Tom Thumb in disguise—Willie Holbrook; "W." who assists Frank during the day. He is scarcely fourteen years of age, yet is a very good operator for his age.

Stepping in this office any time between seven P. M. and seven "A. M." we find our young friend Mr. W. M. Maguire—"W. M.," who runs the string and trains till the wee sma' hours of the morn. Mac is one of the boys.

We will now cross over the river to 193 Broadway, where, at the Midland table, we find our old time friend Mr. J. W. Jarvis—J. who has travelled far and wide, both north and south, as well as east and west. He works No. 2 Midland wire to Oswego and way office. As we are not very well acquainted with the other operators who happen around to No. 2, we will bid adieu to this office and saunter down to 96 Liberty street, where we find Mr. Isaac Wortendyke—"W.," the son of President Wortendyke. Its fearful hard work to raise Ike, but then he has a great deal of writing to do, so we will excuse him and recross the river to Jersey City, where we will step in to see our friend Mr. W. E. Huntington, "U. N.," at 18 Exchange place ("Sx" office) who works on Nos. 1 and 2 Midland, and 9 A. & P. Long Branch wires. After taking a smoke with him we bid him farewell, and pass out just in time to catch the train. We whirl past the stores and streets of old Jersey for a couple of miles, when we leave the Penn. Central tracks and branch out on our own hook past West End, J. N. station. We pass on to New Durham, where we find friend Greenleaf—"G." enjoying himself all alone in the "Jersey Swamp." We can't say as we envy him his sanctum sanctorum, situated as it is in so lonely a spot. Leaving him in his solitude we pass on to Hackensack. On our way we pass J. C. & A. Junction, "Hs.," and Ridgefield Park, "R. P." The latter place is a very good summer resort, and we are very sorry we don't know the operator's name. At the former place Mr. S. S. Colton—"X"—did preside, until the office was closed about September 23d or 24th. He used to work for the N. Y. & O. M. R. R., at 111 Liberty street, N. Y. "Sid" reminds one very forcibly of a regular down-easter. Now, don't get angry Sid. We know not what he proposes to do now, but whatever he does or wherever he goes may success follow him is our wish. At Hackensack, "H. K." we find our friend Mr. A. Bates, with hardly an exception the most obliging, courteous and gentlemanly agent on the road, who, by the way, has held this position for a long time. At this station we also find Supt. Lewis, who spends his evenings here with his family at that place of places, "Home." Mr. M. S. Smith, Manager A. & P., 193 Broadway, N. Y., makes this his home also, and here we will stop for the time being and continue our journey in your next, till which time I bid your readers farewell, and sign myself P's. & Q's.

The Colusa Lake and Mendocino Telegraph Company Heard From.

COLUSA, CAL., September 24.

TO THE EDITOR OF THE TELEGRAPHER.

THE TELEGRAPHER has not been much known heretofore in this section—many of the operators here never having seen a copy of it, but, as soon as I got among them I brought it to their notice, and, as the first fruit of my efforts, I send you herewith ten additional names for your subscription list, and expect to come again soon with another list.

This company, the Colusa Lake and Mendocino Telegraph Company, has not been long in operation, but, since it was first initiated, it has built nearly 200 miles of wire, and is still engaged in extending its lines. We have, now, one wire from Colusa to Middletown, a distance of 180 miles, at each end of which we connect with the Western Union Telegraph Company; another from Colusa to Grand Island, which is being extended to College City, a distance of 30 miles, and a third from Colusa to Princeton.

To Mr. P. L. Washburne, who is the present Superintendent of the company, and, also, Manager of the Western Union office at Colusa, is due the initiation of the enterprise, and it is mainly through his energy and persistence that it has been established. He succeeded in interesting four others, capitalists, in it, and, in a comparatively brief time, they have accomplished what I have stated above.

Although we are rather out of the way, we do a lively business, and two operators are required to do the business of this company and the Western Union in the Colusa office.

The other officers of the company are as follows: President, Mr. J. K. Giles, of Princeton; Secretary, Mr. J. B. De Janette; Treasurer, Mr. J. B. Cook; and Mr. J. Stanton, Assistant Superintendent.

You will hear from me again before long, and, in the meantime, you have my best wishes and practical efforts for the success of THE TELEGRAPHER, to which I was a subscriber, and whose value and importance was fully appreciated when I was in Canada.

MAX ALIUS X,

Chief Operator C. L. & M. Telg. Co.

The Telegraph College Humbug Again.

TO THE EDITOR OF THE TELEGRAPHER.

IT does seem as if people loved to be humbugged, and the greater the humbug the better pleased they appear to be with it. How young men, especially in this enlightened day and age of the world, will read such infamous lies, as are largely circulated by these self-styled telegraph institutes and colleges, and will, without any further knowledge of these grand humbogs, allow themselves to be drawn into such a trap, I must confess is something I cannot fathom. If the circulars were not such bare faced lies; if they did not picture the thing out in such glowing terms; if they would not hold out inducements, which any sensible person, whether familiar with telegraphy or not, ought to know can never be realized, and more especially in the present state of affairs when so many old and experienced operators are unable to obtain situations. And these so-called telegraph colleges guarantee to provide the victim with a first class situation in three or four months from the time they enter the trap. A young man came to me to-day and wished to know if I had any one learning with me, and I answered him in the negative. He wanted to know what the chances were for getting in with me to practice. I told him, no show whatever; whereupon he said, "No one with you, and no chance for any one to get in?" Said I, that is just the way the matter stands with me. Then he told me, how he had been victimized at one of the humbug telegraph institutes of our land. He had spent over one hundred dollars, and was like the woman of old who came to our Saviour with an issue of blood. She had spent all she had with physicians, and was nothing better, but rather grew worse. So with the young man, he had spent all he had and was no better off—so far as telegraphy was concerned; but he has learned a lesson he will never forget. I advised him by all means to drop the matter and forever banish the idea of learning telegraphing, and he concluded to follow my advice. He said what I told him was just what several other operators had told him, but he had found it out after it had cost him dearly for the lesson. I told him that he did not deserve to be pitied, and still I could not help feeling sorry for him. His is only another case of misplaced confidence. If young men could only see the numerous exposures of these humbug colleges in the columns of THE TELEGRAPHER from experienced operators, they might be saved much needless expense and be wiser in the end, but as long as telegraphing continues, and base, unprincipled men who know enough about the business to entice innocent and unsuspecting youth into their traps by their glowing advertisements and false inducements can be found, just so long will humbug telegraph colleges

exist. Unless the law is brought to bear against them, and it ought to be in every instance, a humbug of any kind whatever should be exposed, and all intelligent persons do not hesitate in the least to pronounce all of these telegraph colleges and institutes grand humbogs. Enough has already been said through the columns of THE TELEGRAPHER in regard to these colleges, and it is not necessary to say anything further to the fraternity upon the subject, only, in all instances, deal with them as you would with any other fraud. We have already students enough in the land without encouraging any more to learn in colleges. Perhaps, some day operators will get their eyes open and see in just what a situation they are placing themselves by filling up their offices with learners. Nearly all operators are anxious for a Union. What good will such a thing do unless you guard against learning so many, who will cut your own telegraphic throats as soon as an opportunity presents itself?

OLD OPERATOR.

Are Brooks' Insulators Liable to Damage from Lightning?

ERIE, PA., Oct. 5.

TO THE EDITOR OF THE TELEGRAPHER.

OCCASIONAL and Mr. David Brooks do not seem to agree on the bursting of insulators at the top by lightning. And I wish to give my experience in the matter. As neither of these parties pay me anything for this letter of course I shall side with neither, but merely write what I have seen. My experience has been limited, as compared with the intelligent repairer whom "Occasional" quotes, but I have never, in ten years' experience with the Brooks insulator, found one of them injured in any way by lightning, although I have in several instances found the covered end broken open where they have been exposed to extreme heat, and the cross arm burned off—the breakage being caused, as I believe, by the melting of sulphur in the closed end by the burning arm. During the last four years I have taken down ninety-five miles of cross arms, and on taking the insulators out have found them in every instance uninjured.

We have thirty-seven miles of Erwinger (glass) insulators, and I have noticed that the lightning damages about ten poles on glass to one on Brooks insulators.

GEO. W. MOORE, Repairer.

Miscellaneous.

NEW ELECTRO-MAGNETIC STATION INDICATOR.—Mr. Charles W. White, of New York City, has patented, August 18, 1874, through the Scientific American Patent Agency, a quite ingenious station indicator, by means of which the names of places printed on an endless band are caused to appear and change by the action of mechanism, controlled by electro-magnets. The rollers over which the hand passes are geared to each other, and are rotated by a spur wheel, which is itself turned by a ratchet, in which a pawl engages. The latter connects with levers vibrated by the movements of the magnet armatures, so as to cause the pawl to turn the ratchet, and so cause the band to move around the rollers. There are two sets of this gearing, in order that the hand may be turned in either direction. In addition to this, there is a check pawl, which is lifted when the carrying pawl is operated. This locks a ratchet, so that the band is firmly held at any point until again set in motion by the mechanism. The indicators are placed in any convenient position in the cars, and from each set of magnets an independent circuit is led to the point whence the machine is to be controlled, where a suitable closer is placed in each circuit. Upon one circuit being closed, the indicating ribbon is unwound from the top roll, and wound on the lower one; the other circuit established, the reverse takes place. The mode of locking the mechanism and the ratchet arrangement for turning the rolls are novel, and embrace efficient improvements in the electro-magnetic principle for operating station indicators.

NEW MAGNETO-MECHANICAL SEPARATOR.—A new form of magnetic separator, for the removal of fine particles of iron that become mixed with turnings and filings of copper and brass from workshops, has recently been devised by M. Varin, of Paris.

Two superposed hollow cylinders turn in the same direction, and upon them the material to be separated is scattered through a hopper. The surface of the cylinders consists in bands of soft iron which are kept in a magnetic state. The particles of iron are attracted to these cylinders, and at a certain period of revolution are brushed therefrom into a receptacle, while the scraps of other metal fall to the bottom of the apparatus. The machine is said to be capable of separating 1,000 pounds of material per hour. It has also recently been employed by M. Magnon, for detecting titanic iron in arable earth, with remarkable precision, the iron, in such small quantities as fifteen or even seven grains in twenty-two pounds of earth, having been readily separated.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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THE TELEGRAPHER is the only generally recognized and established representative of the

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The Proposed New Electrical Association.

THE movement which was initiated in Chicago on the 14th ult., for the formation of an American Electrical Association, appears to be exciting considerable interest on the part of the electricians and telegraphers of the country. The necessity and advisability of such an organization has long been evident, and we trust that it will now be carried forward vigorously and intelligently, and that it will have enrolled in its active membership all those who are interested in electrical science and the telegraphic art in this country and the adjoining British provinces of North America. The American and Canadian telegraphs are really parts of one system, and are mutually affected by whatever is of interest and importance to either.

It has been suggested that a better name than that of "American Electrical Society" should be adopted, as the term "Electrical" does not properly describe either the character or objects of the proposed association. The title of the English association, to which this is somewhat analogous, though, of course, it will differ from it in many important respects, is that of "The Society of Telegraph Engineers." This expresses exactly the character and composition of the association; but, of course, this would not be appropriate for the new American society. There can hardly be considered as existing in this country a class or profession distinctively characterized as telegraph engineers, although there is in England and on the continent of Europe. We have here some of the ablest electricians in the world, and some as capable managers and constructors of telegraph lines as can be found anywhere, but they combine these pursuits with others, so that they can scarcely be classed under one title. Perhaps a better and more appropriate name for the society would be "The American Society of Electricians and Telegraphers." We make this suggestion without consultation with any of the gentlemen who are engaged in completing and perfecting the organization, for such consideration as they may deem it worthy of. As it is proposed to admit to the membership of the association all who are interested in electrical science and practical telegraphy, whether actually engaged in telegraphic enterprises or not, it is somewhat important that the name finally adopted shall be such as to fully express the character of the association, and which shall not have a tendency to prevent any one from becoming a member who properly is entitled to membership.

It has for a long time been felt by leading electricians and telegraphers that the interests and reputation of the electricians and telegraphers of the country required an organization which should combine them into a body, which should secure for them that recognition at home and abroad which otherwise could not be obtained, notwithstanding the recognized ability of individuals among them. Another important object to be gained will be the concentration and development of the views of the members in the papers which will be read and the discussions which will take place at the meetings, upon subjects of scientific and practical importance in connection with electricity and telegraphy. If properly organized and conducted this society will eventually become a recognized authority in the decision of questions which are constantly arising in the progress of electrical science and telegraphy. It will render in this way an important service. We trust that it may be organized and conducted in a most catholic spirit, and that there will be no undue prejudice exhibited towards any who may desire to present their views, discoveries and inventions, and submit them for examination, discussion and criticism. The publications of the society will thus deservedly occupy a prominent position in the scientific and telegraphic world, and the good results which may reasonably be expected to follow cannot now be adequately estimated.

While we counsel liberality on the part of the society, we would also express the hope that electricians, and telegraphers generally, will realize the de-

sirability and advantage of cordially coöperating in the movement, and connecting themselves with and taking an active part in its proceedings. We had hoped that the society, when organized, would have had its headquarters in New York, but, as there has not been manifested here a desire or determination to establish it, and there has been a practical effort on the part of our Western brethren, we cheerfully concede to them the honor. It really does not materially matter where the headquarters are. The principal object will be accomplished wherever the society may nominally be located.

Explanatory.

IN consequence of the absence from the city and the severe and protracted illness of Mr. F. L. POPE, he has been unable for some time to continue his interesting and valuable series of articles on the "Elementary Principles of Electrical Measurement." His health is improving now, however, and we hope to be able to recommence publication of the series soon, and continue them regularly until they are completed, during the remainder of the present volume.

The Western Union Telegraph Company.

THE annual meeting of the Western Union Telegraph Company will be held on Wednesday next, at which time the usual report of the business for the year ended June 30th will be presented to the stockholders, and the election of directors for the ensuing year will take place. The present management of the company will, no doubt, be continued in power, and the changes, if any, will be unimportant.

The annual report of Mr. ORTON is looked for with much interest, as it will not only show the results of the business for the past fiscal year, which has witnessed a very material reduction in the tariff of charges for telegraph services, the wisdom of which was questioned at the time, but will doubtless explain in detail the policy, present and prospective, of the company, which to so great an extent represents the telegraph interests of the country. We are inclined to think that there will be some reduction of the gross receipts of the company, consequent upon the reduction of tariffs alluded to, and upon the effects of the panic of last fall and the subsequent business prostration, but this has probably been much more than compensated for by a reduction of expenditures.

We shall also be informed in regard to duplex, quadruplex and automatics, as fast systems of telegraphy are the necessity of the Western Union as well as other telegraph companies.

The resumption of regular dividends, so long suspended, is a legitimate subject of congratulation to the stockholders of the company, and the prosperous financial condition of the company which it indicates, establishes a strong point in favor of the present management. We shall, at as early a date as possible, present this report in full to the readers of THE TELEGRAPHER, as it is certain to be one of the most interesting and important telegraphic documents of the season. Mr. ORTON'S reports are always very excellent reading, and if, like the rest of us, he sometimes makes mistakes, he certainly recants them fully and candidly, as has been fully shown in the case of the duplex invention of Mr. JOSEPH B. STEARNS. We hope that in the present instance he will see his way clear to do equal justice to the automatic system, of which hitherto, judging from his official utterances, he has had a scarcely more favorable opinion than he had originally of the duplex.

We do not believe that Mr. ORTON intends to deal unfairly with any telegraphic system or invention, even though it may not be exactly in the interest of the company whose executive chair he so ably fills, but being a man of pronounced opinions upon most subjects presented for his consideration, he sometimes is betrayed into too hasty decisions and expressions before fully understanding the subjects of which he speaks officially.

The position of President and Executive Manager of

the Western Union Company is an onerous and responsible one, and any person who may endeavor to discharge its manifold duties as effectually as does Mr. ORTON, necessarily has not the requisite time to personally investigate practical telegraphic matters, and must, consequently, depend upon the advice and representations of others in deciding upon them.

Success and Failure in Telegraph Cable Laying.

THE failure to successfully lay the cable of the Direct United States Cable Company from Ireland to Newfoundland has relieved the Anglo-American Company from the danger of competition for another year at least. There seems to have been a fatality about this enterprise. Our readers will remember the delays which were encountered in completing even the comparatively short section of the cable between Torbay, Nova Scotia, and Rye Beach, New Hampshire, and from Torbay to the Newfoundland Coast. The Faraday at that time disappeared for some ten days at one time, and government vessels were sent out in search of her. It was reported at the time that she was lost in a fog, and it would seem that she has emerged from the fog only to lose the larger and more important section of the cable in a storm. It is true that the intention is announced of sending the Faraday out again, as soon as she can be provisioned and coaled, to make another attempt to recover the cable, and, if successful in so doing, in completing the laying of it; but there is little hope of success. The season is too far advanced to encourage the hope that the broken cable can be recovered and laid during the present year.

It is to be regretted that there should have been such a bungling failure after all that has been written and said on the subject of competition in Atlantic telegraphy, and of what the new cable was to accomplish. It is, moreover, a serious disappointment to the companies competing with the Western Union Company in this country, whose position would doubtless be considerably improved if they could have an independent communication with the people and the telegraph systems of Europe.

There are not wanting those who are uncharitable enough to assert that it was not really intended to complete the laying of this cable the present season, but that it was desired to postpone it until definite favorable action could be obtained for abolishing the present monopoly of the Anglo-American Company of landing cables on the coast of Newfoundland. The expense and damage arising from the delay are so great, however, that such a supposition scarcely seems reasonable.

The work had proceeded so far that we had really become convinced that we were to see the experiment tried of actual competition in Atlantic telegraphy, in good faith, although, as our readers know, we were somewhat sceptical in regard to it in the earlier stages of the enterprise. The new company, at the best, would have labored under many disadvantages, but those engaged in the work were confident that these would not prevent its being a success. However, it is all over for the present, and we must wait as patiently as possible to see what another year may bring forth.

While the direct cable was meeting with misfortune the Great Eastern was engaged in laying a new cable for the Anglo-American Company, in which work it was, as usual, entirely successful. The experience which has been gained by the Telegraph Construction and Maintenance Company's employes in cable laying is undoubtedly most valuable, and they do not consider the work at all uncertain or hazardous. But little talk or fuss was made about the undertaking, but when the cable was ready it was loaded into the Great Eastern, and although some rough weather was encountered, when once commenced the work was steadily continued until completed, and the Anglo-American Company, without any addition to capital, has had another cable added to the three already in use. The company is to be congratulated upon its good fortune in this and other respects, and its stockholders may

confidently reckon on comfortable and comforting pecuniary returns for their investment in ocean telegraphy.

Put your Telegraph Lines in Order for the Winter.

THE advancing season should remind telegraph managers of the necessity for putting their lines in order for the stormy months of the fall and winter. During the past year much less money has been expended, generally, on reconstruction and repairs of telegraph lines in this country than usual, and the result is beginning to be seen in the condition of the wires. While economy is not only desirable but essential, if telegraphic investments are to become permanently remunerative and profitable, reducing below certain limits the amount appropriated for maintaining in good condition the lines, is the reverse of economical. Although the money thus saved may for the time be very comforting to stockholders and investors in telegraph property, eventually it will prove to have been very dearly earned. The dollar received now must be replaced with two dollars at no distant period. The earning capacity of telegraph lines is also materially and constantly reduced by neglect to maintain the wires in a state of efficiency, and thus the damage is ultimately felt both ways, in increased cost, and in the reduction of earnings.

While the lines have gone through the spring and summer without serious interruption, the storms of the fall and winter, finding them in a depreciated condition, will tell upon them with added force unless immediate measures are taken to remedy the defects which have been and are being constantly developed. It will be found to be the truest economy to at once appropriate the amount required to put all the wires in the best possible condition. The telegraphs of the country have mainly recovered from the depression consequent upon the panic, and most of them are again receiving liberal patronage.

The telegraph prospects are good, and, although it is too late to look for any considerable extension of telegraphic facilities the present year, there is good reason to anticipate that, by next season, the effects of the panic of last year upon the business of the country will have mainly passed away, and that a fair amount of construction and extension of telegraphs may be anticipated. Comparatively little new line has been built this year, which will necessitate additional construction another season. With a return of prosperity to the general business interests of the country, which cannot much longer be delayed, those engaged in telegraphic enterprises may look for renewed and increased prosperity to their interest.

Why We Criticise and Commend.

It is much pleasanter to praise than to blame, to commend than to censure and denounce. While we have never hesitated to criticise and condemn in cases where such appeared to be demanded, it certainly is not pleasant for us to do either. Wholesome correction is not unfrequently advantageous to the person who receives it, and if it proves unpleasant the party censured, if satisfied that it is not deserved, has the consolation to be derived from that belief, if otherwise, the part of wisdom is to profit by it, and seek to avoid giving occasion for the repetition of the unpleasant experience.

As those who know the writer personally are aware, he is by no means an ill natured or cross grained individual by nature, although the severity which sometimes characterizes our editorial productions may give to others the idea that such is the case. We can only say that it is our desire and intention to be just, and if, unintentionally, we do injustice to any person or interest, our columns are always open for explanation and correction. We would not close our columns against the vindication of even a personal enemy if attacked. As a journalist we have duties to perform and obligations resting upon us which are superior to personal considerations. This we endeavor to keep constantly in

view in conducting THE TELEGRAPHER. As we have before stated we hate and despise shams and humbugs, but we would not refuse even those whom we consider such an opportunity to vindicate themselves from the imputation.

Friendly and Complimentary.

THE crowd of business during the Exposition, the general rush, and one thing or another, not to mention a miserable printer, made our late issue not only late but slim. We had intended sooner to have noticed some editorial remarks of our friend Ashley, of THE TELEGRAPHER. "Let us have Peace," is our motto. We know that he has copied liberally from us, and as liberally credited anything reproduced. We know that for himself, and the paper he so ably edits, we bear the best of feelings and the kindest of wishes, and we think that he feels the same towards us. So, across the bloody chasm of red ink we reach our quill-drawing arm, and, with hearty good will, we say, *Shake!*—*The Plug.*

We have always entertained the kindest feelings towards our friends SELDEN and MATTON, of *The Plug*, and have welcomed their paper to our table semi-monthly with pleasure. Long may they and it wave.

The number for September 15th, which, owing to circumstances above alluded to, has but just come to hand, is a decided improvement on any which have preceded it, and is creditable to the publishers and editors, and the paper deserves to receive a liberal support from the fraternity.

Personals.

Mr. EDWARD H. RICH having resigned his position as superintendent of telegraph and train despatcher on the Southern Central Railroad, his friends on the road presented him with a valuable clock and a handsome silver water pitcher and goblets. The board of directors also passed resolutions very complimentary to Mr. RICH's ability and faithful performance of duty.

OLD WAX, the Canadian, who signs "X," has been appointed chief operator of the Colusa Lake & Mendocino Telegraph Co., in the office at Colusa, Cal.

Mr. ROBT. MCFARLAND is manager of the Lakeport, Cal., office of the Colusa Lake & Mendocino Telegraph Company.

Mr. J. H. HENDERSON is manager of the Bartlett Springs, Cal., office of the C. L. & M. Telegraph Co.

Mr. J. H. MCCLURE is manager of the Leesville, Cal., C. L. & M. office.

Mrs. TURNER is manager of the C. L. & M. Telegraph at Turner's Station, Cal.

Mr. J. GUFFEY is operator of the C. L. & M. office at Turner's Station, Cal.

Mr. JAMES NEWELL is manager of the Mountain House, Cal., office of the C. L. & M. Tele. Co.

Mr. H. H. McDONALD is manager of Grand Island, Cal., office of the C. L. & M. Tele. Co.

Mrs. COOK is manager of Grand Island Mills office of the C. L. & M. Tele. Co.

Mr. JOHN SERSANNO is manager of Princeton, Cal., office of the C. L. & M. Tele. Co.

Mr. W. GORDON is manager of the Sycamore, Cal., office of the C. L. & M. Tele. Co.

Miss EVA DUNLAP is manager of Chapin's Landing, Cal., office of the C. L. & M. Tele. Co.

Mr. TORRENCE is the manager of the Grimes Landing, Cal., office of the C. L. & M. Tele. Co.

Mr. CHAS. PERFUNNO is manager of Munchville, Cal., office of the C. L. & M. Tele. Co.

Mr. JOE HOUSTON is manager of Upper Lake, Cal., office of the C. L. & M. Tele. Co.

Mr. J. F. MOORE is manager of Middletown, Cal., C. L. & M. Tele. Co.'s office.

Mr. H. H. HUNT has resigned his position on the Western Union, Chicago, Ill., day force and gone south with the Western Union Company.

Mr. A. J. MERENESS has been transferred from the New York duplex in the Chicago, Ill., Western Union office, to the same position (day), made vacant by the resignation of Mr. HUNT.

Mr. M. A. SMITH has resigned his position as day report operator, Chicago, Ill., Western Union office, to engage in business for himself as a short-hand writer.

Mr. STONE, of the night force, Chicago, Ill., Western

Union office, has been promoted to the position vacated by Mr. SMITH.

Miss ALICE NUTE, of the Western Union Chicago, Ill., office, has resigned, to accept a position in a photographic office, where she can give her time more exclusively to the study of that art.

Mr. JOHN KEMP has been promoted from the night force, Chicago, Ill., Western Union office, to the position on the South Water street office (day), vacated by the resignation of Miss NUTE.

Messrs. DUG. BURNETT, AUSTIN, KNOX and CUSHING have accepted regular positions on the Western Union Chicago, Ill., night force. The three latter gentlemen have been "subbing it" for some time.

Mr. J. BRITTON BOGART has resigned his position at No. 145 Broadway, New York, and becomes a train despatcher at Wilkesbarre, Pa.

Mr. DAVID B. MITCHELL has resigned his position at No. 145 Broadway, New York, and goes with the Western Union at New Orleans, La.

Mr. ABRAM J. LOCKE, of Peace, Kansas, whose crops were damaged to the extent of \$2,500 by the grasshoppers, has returned to No. 145 Broadway, New York, after a brief respite passed with his family, and purposes to repair the ravages in his fortune by another siege of hard work at the key.

Mr. JOHN W. McLAREN, of No. 145 Broadway, New York, goes home to his people in Canada for a month's vacation.

Mr. JUDD PERKINS has resigned his position with the Western Union Company at Duxbury, Mass., and engages in other business at Meriden, Conn.

Mr. THOMAS TOBIN, of the Western Union Syracuse, N. Y., office, has taken a position at 145 Broadway, New York, *vice* Mr. FRANK B. RAE, transferred to Syracuse.

Mr. JACOB GROFF has accepted a position with the Western Union at Chattanooga, Tenn.

The Telegraph.

By Cable.

The Faraday to Sail in Search of the Broken Cable.

LONDON, Oct. 5.—A despatch from Queenstown says the steamship Faraday will start this week to pick up the broken United States direct cable, and will complete laying it to the United States. No serious trouble in finding the cable is anticipated, as buoys were thrown over in the vicinity of the break.

Unsuccessful Termination of the Direct Cable Expedition.

On Thursday of last week the steamers Dacia and Ambassador, the consorts of the cable steamer Faraday, engaged in the work of laying the long section of the direct cable between Ireland and Newfoundland, arrived at Queenstown, Ireland, bringing news of the failure of the attempt to lay the cable. They report that the cable was lost in a heavy gale, after some 600 knots had been laid.

They were engaged with the Faraday several days in attempts to recover the cable but without success, and were compelled to return to Queenstown, because short of coals and provisions.

On Friday morning the Faraday, which followed the Dacia and Ambassador, also arrived at Queenstown.

A cable despatch to the Associated Press states that the steamer Faraday will put to sea as soon as she has taken in provisions and coal, and will resume the attempt to recover the direct cable, of which she had laid 600 knots when it was lost. Should her efforts be successful she will proceed to lay the remainder of the cable to the American coast.

A Telegraph for the Court House.

Mayor HAVEMEYER has signed and approved the resolution of the Common Council, giving the Law Telegraph Company permission to place instruments in the new County Court House, the Register's office, and the building containing the Marine Courts, the General Sessions, and the District Attorney's and Tax Commissioners' offices, the company paying a rental of \$1,000 a year. This will be of great convenience to lawyers and others doing business in these buildings

Foreign Telegraphic Notes.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom during the

week ended September 19th, 1874, was 415,816—an increase of 57,509 on the corresponding week of last year.

The Saigon Hong-Kong section of the Eastern Extension, Australasia and China Telegraph Company's cables, is interrupted. Messages for Hong-Kong can be sent only by post from Singapore, the Great Northern line between Amoy and Hong-Kong being under repair.

At a meeting of the Board of Directors of the Anglo-American Telegraph Company it was resolved to pay the usual interim dividend of 1 1/4 per cent. for the quarter ending September 30th, 1874.

The International Telegraph Conference.

At the International Telegraph Conference, to be held next year at St. Petersburg, a proposal will be made for the neutralization of the telegraphs in times of war. It will be remembered that at the last International Conference, in 1872, at Rome, a similar proposal was submitted by Mr. Cyrus W. Field, the delegate of the United States Government, and warmly supported by the representative of the German States. By a letter from a correspondent at Berlin we now learn that at the St. Petersburg Conference the German Government will again support the American renewed proposal, and strong hopes are entertained of its being agreed to in spite of all opposition. In addition to this the Congress will be occupied in drawing up a set of regulations in the form of an international code of instructions for the telegraph service, as it is found by experience that the Paris Convention of 1865 contains many items of detail that fluctuate according to the circumstances of the times, and require constant supervision and alteration. As far as is known at present, some twenty different States will be represented at the St. Petersburg Conference.

The Telegraph in the United States Army.

Gen. W. T. SHERMAN has written some "Recollections" of our great war, in which he played so conspicuous and effective a part, the latter portion of which has been published, and from this we extract the following on the use of telegraphs in our campaigns: "For the rapid transmission of orders in an army covering a large space of ground, the magnetic telegraph is far the best, though habitually the paper and pencil, with good mounted orderlies, answer every purpose. I have little faith in the signal service by flags and torches, though we always used them, because most invariably when they were most needed the view was cut off by intervening trees or by mists and fogs. There was one notable instance in my experience when the signal flags carried a message of vital importance over the heads of Hood's army, which had interposed between me and Altoona, and broken the telegraph wires—as recorded in my 'Recollections;' but the value of the magnetic telegraph in war cannot be exaggerated, as was illustrated by the perfect concert of action between the armies in Virginia and in Georgia in all 1864. Hardly a day intervened when Gen. Grant did not know the exact state of facts with me, more than 1,500 miles off as the wires ran. So, on the field a thin insulated wire may be run on improvised stakes, or from tree to tree, for six or more miles in a couple of hours, and I have seen operators so skilful that by cutting the wire they would receive a message with their tongues from a distant station. As a matter of course the ordinary commercial wires along the railways form the usual telegraph lines for an army, and these are easily repaired and extended as the army advances, but each army and wing should have a small corps of skilled men to put up the field wire and take it down when done. This is far better than the signal flags and torches. Our commercial telegraph lines will always supply for war enough skilful operators."

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

OCT.	WESTERN UNION.	ATL. AND PAO.	AMER. DIST.
1	80% 81%	.....	.....
2	80% 81%	15% 15%	.....
3	80% 81%	.....	.....
5	80% 81%	.....	37 1/2 40
6	78% 80%	.....	37 1/2 40
7	79% 80%	.....	37 1/2 40

New Patents.

For the week ended September 15, 1874, and bearing that date.

155,062.—ELECTRO-MAGNETIC ENGINES. L. Bastet, Tarrytown, and Chas. J. B. Gaume, Brooklyn, assignors of one eighth their right to Chas. F. Alford, New York, N. Y. Filed August 21, 1874.

Regular series of stationary magnets and revolving armatures. Poles of the magnets are extended, and additional sets of armatures provided to be attached thereto. The extra sets reciprocate and are geared to communicate their force to the main wheel driven by the revolving armatures.

1. In an electro-magnetic motor, the combination, with the electro-magnets and main set of revolving armatures of extra or auxiliary vibrating armatures, arranged and operating to impart to the driving shaft, through proper intermediaries, power in addition to that derived from the movement of the main set of armatures, substantially as and for the purposes specified.

2. The extra or auxiliary armatures, one on each side of each electro-magnet, the armatures of the several pairs being coupled together and geared with the main or driving shaft of the machine, substantially in the manner and by the means shown and set forth.

Born.

HUBBS.—At 9.30 A. M., September 16, 1874, to Mr. C. H. Hubbs, manager Vallejo, Cal., Western Union office, a son—a twelve pounder.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with Iron, consists in its LIGHTNESS, relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.

ALANSON CARY, Treasurer,

No. 234 West 29th St.,

New York.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents.
UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

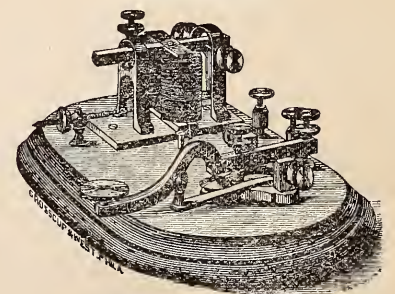
NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

THE PENNSYLVANIA TELEGRAPHIC AGENCY,

WAVERLY HEIGHTS, PENNSYLVANIA.

PEERLESS.



Nickel Plated.

FULL SIZE RAILROAD SOUNDER AND KEY.

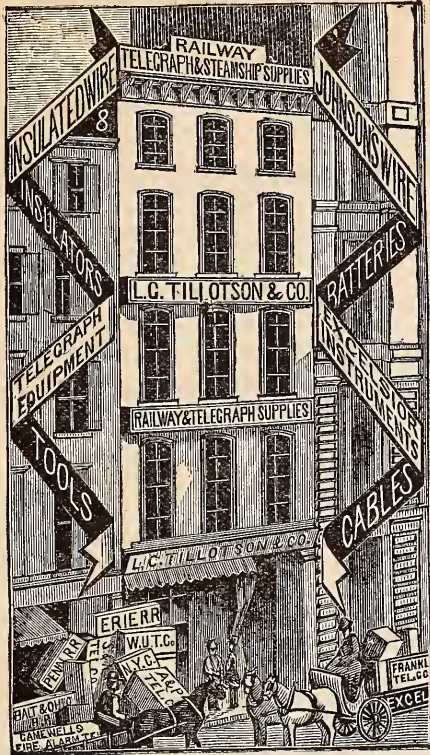
NOTHING MADE OF CAST OR PAINTED IRON. Is finely finished, mounted on Walnut base.

1 cell Callaud Battery, office wire, chemicals, copy Smith's Manual, sent C. O. D. \$12 50

If money be sent in advance by registered letter. 12 00
Instruments without Battery. 11 50

Telegraphic and Electrical goods of every description at manufacturers' lowest prices.

SEND FOR CIRCULAR.



BUY THE BEST.

IF YOU WANT
EQUIPMENT
FOR A
TELEGRAPH LINE,
ORDER OF
L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
and **QUALITY THE BEST.**

THEY GUARANTEE
EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE
CONSTRUCTION AND OPERATION OF LINES
ALWAYS ON HAND.
THEIR
EXCELSIOR
TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
success of the times.

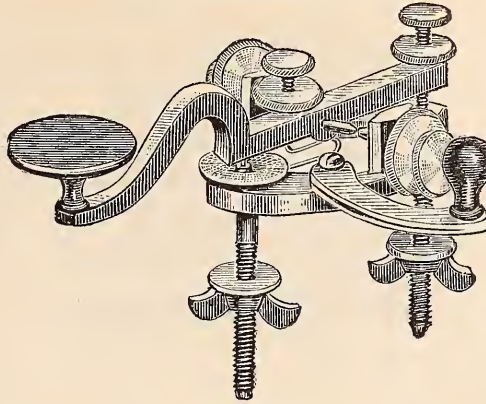
L. G. TILLOTSON & CO.,
8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,
8 Dey Street, N. Y.

WATTS & CO.,
BALTIMORE, MD.



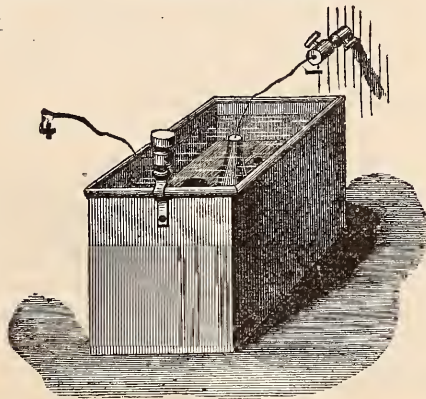
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,
BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,

at the same prices offered by other establishments.
Our new Illustrated Catalogue contains some useful information for Superintendents and others interested in the Science of Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.
The undersigned having secured the exclusive Agency for manufacture and sale of the
EAGLES METALLIC BATTERY,
now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.
These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.
Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.
On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.
No. 2 is a round cell, designed for main line. Price, \$2.
Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,
(P. O. Box 5603.) 38 VESEY STREET, N. Y.

GEO. H. BLISS & CO.,
41 THIRD AVENUE,
CHICAGO, ILL.

TELEGRAPH INSTRUMENTS,

splendidly finished, and mounted on highly polished Rosewood Bases.
RELAYS unequalled for beauty and strength.
GIANT SOUNDERS, without a rival for clear, loud sound.
STRAIGHT and CURVED LEVER KEYS, warranted not to stick.
REGISTER SPRING and WEIGHT, of approved patterns.
POCKET RELAYS, in Hard Rubber Cases; new style.
BOX RELAYS, with or without Keys on base, a specialty; superior in all respects.
IMPROVED COMBINATION INSTRUMENTS for main line.
RELAY, SOUNDER and KEY on same base, making an elegant set.
WILSON, HASKIN, WESTERN UNION and PLUG CUT-OUTS.
HASKIN'S AUTOMATIC REPEATERS, LIGHTNING ARRESTERS, GROUND, BATTERY and REPEATING SWITCHES.
WESTERN UNION (new style) SWITCH BOARDS.
ELECTRIC BELLS, single or vibrating stroke.
MEDICAL INSTRUMENTS, cheap and reliable.

AGENTS FOR
KIDDER'S MEDICAL APPARATUS,
JONES' LOCK SWITCH BOARDS,
HILL'S ANNUNCIATOR and FIRE ALARM,
PUTT'S MECHANICAL INSTRUMENTS,
UNITED STATES ELECTRIC GAS LIGHTING APPARATUS.
POPE'S RAILWAY SIGNALS,
SELDEN'S PRINTER,
ANDER'S MAGNETIC DIAL and PRINTER
GROVE, CARBON, BUNSEN, DANIELLS, LECLANCHE, LOCKWOOD, CALLAUD, SMEE and GRENET BATTERIES.

AGENTS FOR
HILL'S and the EAGLE BATTERY,
KERITE and GUTTA PERCHA WIRES and CABLES.

AGENTS FOR
MOORE & SONS' and PHILLIPS' MAGNETIC and OFFICE WIRES.

AGENTS FOR
ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK, and AWL CLIP.

AGENTS FOR
WASHBURN & MOEN'S celebrated GALVANIZED WIRE; also, AMERICAN COMPOUND WIRE.

AGENTS FOR
BROOKS' INSULATORS,
KENOSHA INSULATORS,
SCREW GLASS INSULATORS,
TELEGRAPH POLES,
BRASS ECCENTRICS,
HAND VICES,
STEEL CLIMBERS,
STUBBS and PATENT PLIERS.
VAUGHAN'S AUGURS and TOOLS in variety.
SULPHATE OF COPPER, NITRIC ACID, SULPHURIC ACID the finest in the Market.
TELEGRAPH BOOKS, MESSAGE PAPER, REGISTER PAPER, and STATIONERY.
SECOND HAND RELAYS, CUT-OUTS and REGISTERS very cheap.

Repairing and Model Work promptly attended to.
Bliss' Manual and Price List furnished free on application.

GEO. H. BLISS & CO.,
41 THIRD AVE.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

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Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,

San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. **GAMEWELL & CO.** are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THESE CAN BE NO QUESTION.**

The coöperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

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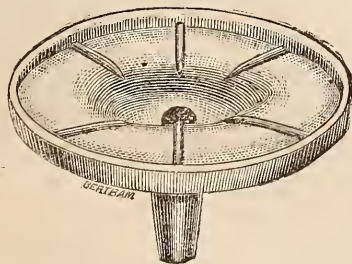
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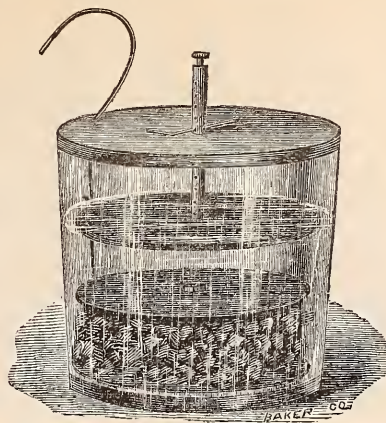
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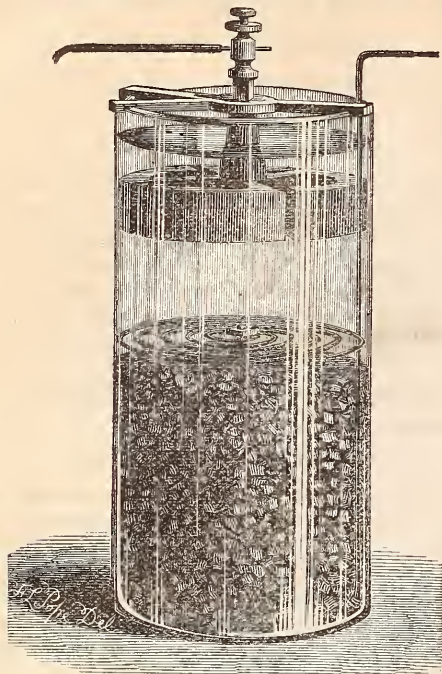
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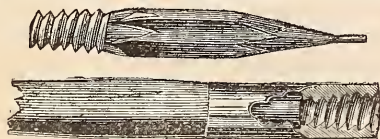
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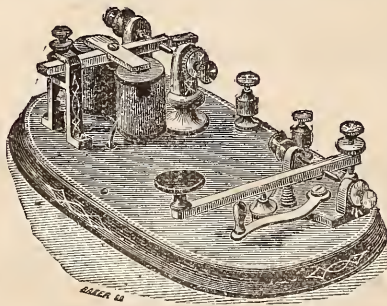
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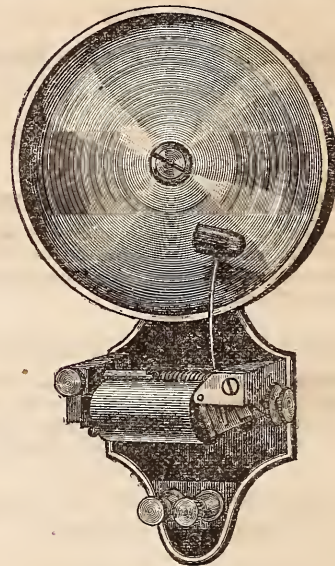


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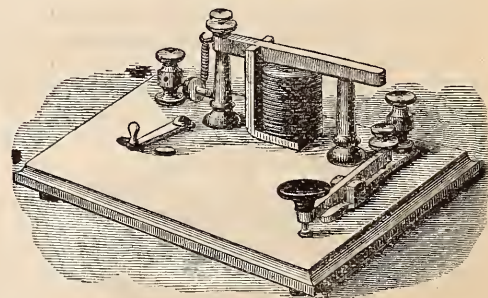
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The Telegrapher

A Journal of Electrical Progress

Vol. X. New York, Saturday, October 17, 1874. Whole No. 431

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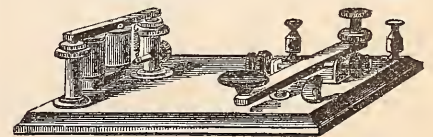
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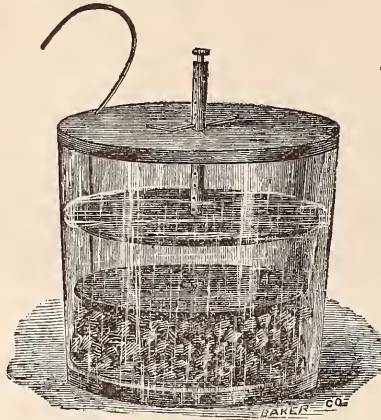
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By FRANK L. POPE.

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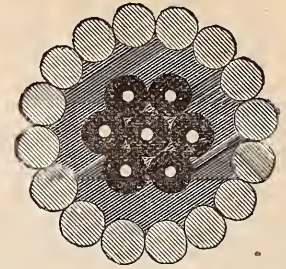
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, OCTOBER 17, 1874.

VOL. X. WHOLE No. 431.

Annual Report of the President of the Western Union Telegraph Company to the Stockholders.

To the Stockholders of the Western Union Telegraph Company.

In pursuance of a requirement of the By-Laws of the company, and of instructions of the Executive Committee, I submit the following Report of the operations of the company for the fiscal year ended June 30, 1874:

The capital stock of the company is \$4,073,410, of which the company owns, and now has in its treasury, \$7,287,735, leaving the capital outstanding \$33,785,675.

The bonded debt is \$5,946,910. Of this sum \$4,448,900 is in seven per cent. currency bonds, which will mature November 1, 1875; and \$1,498,000 in seven per cent. gold bonds, due in 1902. The bonded debt was reduced during the year by the redemption of bonds of the American Telegraph Company, which matured October 1, 1873, amounting to \$89,500, and by the purchase for the Sinking Fund of \$2,000 of the bonds of 1902.

The company has no floating debt. The receipts for the year from all sources were \$9,262,653.98, and the expenses \$6,755,733.83. The difference \$2,506,920.15 is the net profit.

There have been added to the property of the company during the year, by construction, purchase and lease, 5,828 miles of poles, and 21,264 miles of wire, being equal to about eight per cent. of line and twelve per cent. of wire; and 448 more offices were in operation at the close of the year than at the beginning. The company operated at the close of the year, 71,585 miles of line, 175,135 miles of wire, and 6,188 offices.

The \$2,506,920.15 profits of the year have been applied as follows:

Interest on Bonds.....	\$315,138 83
Construction of new lines and erection of additional wires.....	511,849 52
Purchase of the stock of sundry telegraph companies in the Western Union system on which rent is paid annually.....	96,282 00
Patents.....	3,000 00
American Telegraph Co.'s Bonds redeemed Oct. 1, 1873.....	89,500 00
Sinking Fund for redemption of Building Bonds of 1902.....	30,000 00
Real estate (of which \$281,234.81 was expended on the building, Broadway and Dey street, in excess of the loan of \$1,500,000).....	291,602 33
Dividend of two per cent. payable July 15, 1874.....	675,574 00
	\$2,012,946 68
The balance.....	\$493,973 47

has been carried to the credit of Income Account, and is included in the following exhibit of the application of the company's

PROFITS FOR EIGHT YEARS.

The surplus of Income Account, July 1, 1866, was	\$275,357 24
The net profits for eight years, from July 1, 1866, to June 30, 1874, were.....	22,839,538 96

Making an aggregate, June 30, 1874, of.....\$23,104,896 20

Of this sum there has been—

Distributed in dividends to stockholders (including dividend payable July 15).....	\$5,532,813 34
Disbursed for interest on the Company's bonds.....	2,531,333 81
	\$8,064,147 15

The balance.....\$15,040,749 05

is represented as follows:

Construction of new lines, erection of additional wires, purchase of patents, &c.....	\$4,991,453 15
Purchase of telegraph lines and of the stock of companies controlled by the Western Union Company on which interest or dividends are paid as rental.....	1,301,985 45
Western Union stock (72,877 shares).....	4,054,483 07
Gold and Stock Telegraph Co.'s stock (47,710 shares).....	1,173,509 00
International Ocean Telegraph Company's stock (10,354 shares).....	961,556 42
Ando-American Telegraph Company's stock (\$1.308).....	10,000 00
Central District and Printing Telegraph Companies' stock (Pittsburgh), 200 shares.....	10,000 00
Western Electric Manufacturing Company's stock (500 shares).....	39,000 00
Western Union Bonds—redeemed and cancelled.....	1,072,345 00
Sinking Fund—Broadway and Dey Street Mortgage Bonds (amount not yet used for redemption of bonds).....	87,800 00

Real estate (other than Broadway and Dey street property).....	328,830 66
Broadway and Dey street property (in excess of the loan of \$1,500,000).....	281,234 81
Total.....	\$14,282,197 56
Leaving a surplus of.....	\$758,551 49

Represented as follows:

Materials and supplies on hand.....	\$440,051 49
Due from United States.....	70,000 00
Due from Agents.....	75,000 00
Cash on hand and loaned on call, in excess of amount required for dividend July 15th, and for current liabilities.....	173,500 00
	\$758,551 49

PACIFIC AND ATLANTIC TELEGRAPH COMPANY.

In my last Annual Report it was stated that we had acquired a majority of the stock of the Pacific and Atlantic Telegraph Company, and that negotiations were then pending for a lease of its lines to the Western Union Company. The negotiations were concluded in December last, and on the first of January the lines and property of that company were turned over to us on a lease for ninety-nine years, at an annual rental equal to four per cent. on the capital stock of \$2,000,000, the rent to be applied first to the payment of the debts of the P. and A. Co., and thereafter to be distributed *pro rata* among the shareholders. Of the capital of \$2,000,000 the Western Union Company owns \$1,415,950. The entire rental for the year 1874 will be required to pay the debts of the P. and A. Co. It is probable, however, that thereafter the rental can be distributed among the stockholders.

THE INTERNATIONAL OCEAN TELEGRAPH COMPANY.

The operations of this company during the past year have been very satisfactory, and give promise of still better results in future. As I write, however, communication by cable between Punta Rassa and Key West is interrupted, but the necessary steps have already been taken to repair the cable, and it is expected this will be accomplished in a short time. The new cable between Key West and Havana, successfully laid the year before, has been paid for, and the entire floating debt of the company discharged out of last year's earnings. There are now two good cables between those points. Unless it shall be found necessary, in order to insure permanent communication between the United States and the West Indies and South America, to lay an additional cable between Punta Rassa and Key West, it is probable that payment of dividends to the stockholders of the I. O. T. Company will be resumed within a year. This property is destined to increase largely in value in the near future.

The receipts of the I. O. T. Co., for the year ended June 30, 1874, were.....	\$308,870 99
Expenses.....	71,561 13
Balance, net profit.....	237,309 86
Add proceeds of \$80,000 bonds issued.....	72,000 00
	\$309,309 86

This has been appropriated as follows:

Paid India Rubber, Gutta Percha, and Telegraph Works Co., balance due for new cables.....	\$94,640 87
For expenditure on S. S. "Professor Morse".....	71,533 26
For loans repaid.....	49,500 00
" bonds redeemed.....	25,800 00
" reconstruction of cables.....	22,770 13
" interest on debt.....	20,418 40
" construction.....	2,836 64
	287,499 30
Balance, merged in general assets.....	\$21,810 56

THE GOLD AND STOCK TELEGRAPH COMPANY.

Of the \$2,500,000 capital of this company, the Western Union Company owns \$1,192,750. Its gross receipts for the fiscal year ended September 13, 1874, were \$581,000, and the operating expenses \$419,000, leaving \$162,000 as the net profit, all of which was expended in the extension of its lines and the provision of new apparatus, of which a large quantity was required in view of the extremely low rate fixed for the rental of Stock Reporting instruments to meet the competition of the Manhattan Quotation Company. The Gold and Stock Company has expended out of its net earnings during the last four years over \$700,000 for new lines, machinery and apparatus.

MONEY TRANSFER SERVICE.

The operations of the Department of Telegraphic Money Orders, which has been established less than three years, are highly satisfactory. During the last year it transferred—that is, received at one office and paid out at another—about \$2,000,000, for which service the company received a revenue of \$80,329.86. Of this sum about \$20,000 was for premiums, and the balance for tolls on the messages required in making the transfers. The revenue from this source during the preceding year was about \$57,000, and the increase during the past year has been about 40 per cent. The increase in the number of transfers, however, was about 60 per cent., attended by a reduction of the average amount transferred in each case from \$81.31 the preceding year to \$61.83 during the past year. This reduction

and increase indicates the growing popularity of the service. The receipt in small sums, at a large number of offices, of an aggregate of \$2,000,000, and the payment of this amount at other offices, involving the handling of \$4,000,000, has been attended by an aggregate loss to the company during the year, from errors and defalcations, of only \$110. During the same time a larger sum has accumulated in the treasury of the company from cases where it was impossible to find either the transferee or the person making the deposit for transfer. This branch of the service is under the immediate charge of Vice-President Mumford, who prepared the rules and regulations for the conduct of the business. In view of the success which has attended their operation, this specific acknowledgment seems to be due to him.

THE NEW BUILDING.

At the close of the fiscal year, June 30, 1874, the account with the new building presented the following exhibit:

Paid on account of real estate.....	\$855,000 00
Paid to architects and contractors.....	689,511 25
Paid engraving, printing, commission on sale and other expenses of negotiating the bonds.....	17,190 81
Taxes.....	21,369 56
Interest on bonds.....	204,163 19
	\$1,781,234 81

Of this sum \$1,500,000 is represented by the bonds of the company due in 1902, and the balance, \$281,234.81, has been paid out of current earnings. To the latter may now be added the further sum of \$153,080.98, paid during the quarter ended September 30th, making a total of \$434,315.79, for which the building account is indebted to income account.

The work on the building was greatly delayed during last fall and winter by the failure of the contractors to supply the granite at the rate agreed upon, and later, by delay in the delivery of other materials. The work is now progressing rapidly, and it is expected the portion to be occupied by the company will be ready by Christmas.

GENERAL REVIEW.

A comparison of the results of the company's operations during the last fiscal year, and the one preceding, shows a reduction of \$70,364.53 in gross receipts, and of \$251,042.54 in the net profits.

This diminution of receipts and profits resulted from two causes; first, the reduction of rates, which took effect on July 1, 1873, pursuant to plans formed and instructions issued six months before; and second, to the financial panic of September, 1873, and the general stagnation in every department of business which immediately followed, and from which there has been but a partial recovery.

Commencing with July, 1873, the profits, as compared with the corresponding months of the preceding year, were less each month up to and including February, 1874, at which time the aggregate falling off for the eight months of the fiscal year was \$589,564.09.

For March the profits were in excess of March, 1873, and at the end of June the increase over the corresponding four months of last year amounted to \$338,521.55, leaving a deficiency of \$251,042.54, as stated above.

Although this report is for the year ending June 30th last, it seems proper to add, in this connection, that the profits for the first quarter of the current year, which ended September 30th, show an increase over the corresponding months of last year of more than \$300,000.

The fiscal year is from July to June, both inclusive. A comparison of the business of the calendar years 1873 and 1874 shows that the profits of the nine months of 1874, ended September 30th, are in excess of the twelve months of 1873; the excess during the seven months ended September 30th being \$649,434.73 over the corresponding seven months of 1873—an average increase of over \$100,000 a month.

The number of messages transmitted during the last year was 16,329,256, being an increase of 1,872,424 (about 13 per cent.) over the preceding year. Deducting from the gross receipts moneys received from other sources than for the transmission of messages, and dividing the remainder by the number of messages, it appears that the average receipt for each message was about 55 cents. As the charge per message is for a minimum of ten words, the average message must contain more than ten words; so that the average receipt per message is necessarily greater than the tariff fixed for a ten word message. A uniform tariff of 50 cents per message of ten words between all stations on the company's lines, without regard to distance, applied to the messages transmitted during the last year, would have yielded a revenue somewhat in excess of the actual receipts.

The tariff of rates now charged on the lines of the Western Union Company are but little above the average European rates. Considering the vast difference in the density of population, and the greater distances over which messages are sent in this country, and the cost of maintaining a greater length of line through sparsely

settled sections, to reach the same number of people, and the higher cost of labor and of all material employed in telegraphic operations, the service in this country is relatively much cheaper than the average in Europe.

DUPLEX AND QUADRUPLIX TELEGRAPHY.

The duplex apparatus of Mr. J. B. Stearns, by means of which two messages are transmitted in opposite directions upon one wire at the same time, has fully sustained the opinion of its utility and value which I expressed in my last Annual Report. It has been put in operation during the past year upon a number of additional circuits, and is now working successfully between all the principal cities. Its latest application was upon the lines to the Pacific coast, and it is now in use between Port Hastings, on the Island of Cape Breton, where our lines connect with the cable wires, and San Francisco, a distance of nearly 5,000 miles.

But the past year has produced an invention more wonderful than the Duplex. Mr. Thomas A. Edison and Mr. George B. Prescott, the Electrician of the company, have discovered processes and invented apparatus, by means of which two messages can be sent in the same direction, and two other messages in the opposite direction simultaneously upon one and the same wire. This invention, which they have christened the Quadruplex, has been in successful operation between our New York and Boston offices for the last two weeks, and is satisfactorily performing an amount of work upon one wire quite equal to the capacity of four wires worked with the ordinary Morse apparatus.

The inventors claim that the quadruplex may be used either as one wire, as two wires, three wires, or four wires, as the pressure of business may require; that when it is worked as two wires, intermediate stations may be inserted, and may send and receive as with two separate wires in the ordinary way.

I have given much personal attention to the development of this invention, in the belief that if it could be utilized to the extent claimed by its inventors it would solve satisfactorily the most difficult problem which has ever been presented to the managers of telegraph companies, and that is: How to provide for the rapidly increasing volume of business without an annual expenditure for the erection of additional lines and wires that would prevent the payment of reasonable dividends to stockholders? So much has been accomplished already, and in so short a time that it seems more likely that these predictions will be fully realized, than that the fulfillment will fall materially below the promise.

In my last Annual Report I made the following statement concerning the duplex apparatus:

"We are now operating more than 150,000 miles of wire, and during the past two years have been extending at the rate of nearly 20,000 miles of wire per annum. The duplex apparatus is capable of doubling the capacity of these wires at a comparatively small cost. The value of this increase of facilities can be approximately ascertained by estimating the saving in the investment for wire, and the annual saving in repairs and maintenance of additional wires. But the great value of the duplex does not consist in the saving in the investment in wires, and the cost of repairs and maintenance, but in its ability to double the capacity of a wire when we have but one, and when no amount of money previously invested in wires, or even possible to be expended in repairs, can provide another."

These remarks will apply with even greater force to the quadruplex, if it shall prove capable of working through the same distances, and under like conditions as the duplex. It is not easy to estimate the value of an invention which enables any and every wire between all the principal cities in the country, and between the Atlantic and Pacific coasts, to be made equal to two, in a minute, by merely turning a button; but it is very evident that the ability to practically convert one wire either into 2, 3 or 4, as the convenience or necessities of the business may require, is still more valuable.

The quadruplex, like the duplex, is partially substituted for, and worked in connection with the Morse apparatus. No change in the ordinary operating force, nor any previous preparation of messages is required, as with the automatic system, so that a continuance of the same simplicity and economy of manipulation and promptness of service which have characterized the Western Union Company's system of telegraphy is assured. All the essential patents for the duplex are owned by this company. Negotiations for the purchase of the patents of the quadruplex are pending, but the terms will not be settled until after the character and extent of its capacity for work have been more fully ascertained.

"FAST" TELEGRAPHY.

This is the favorite designation given by its friends to what is better known as the automatic system. Why it should be called "fast,"—in view of the fact that, before a message can be sent at all, more time must be spent in getting it ready for the transmission to begin

than is required to send and deliver it in the ordinary way—I have never been able to comprehend.

In this review of telegraphic operations during the last year it is only necessary to say concerning "fast" telegraphy, that the progress of its development has been exceedingly slow. The latest attempt to utilize it in this country was made in 1869, on a line of one wire between New York and Washington, and now, at the end of five years, it stands about where it began.

Although the evidence which I have accumulated is not sufficient to convince me that automatic telegraphy possesses any value to the Western Union Company, in view of its control of the duplex, and of the probable utilization of the quadruplex, yet I have not failed to give careful attention to the subject, and whenever it shall be demonstrated that any system of automatic telegraphy can be advantageously used on our lines, it will be promptly introduced. The claim that anything essential to the successful operation of automatic telegraphy—whether by the chemical paper plan of Bain or the later one of Wheatstone—is covered by controlling patents, is without foundation.

RESUMPTION OF DIVIDENDS.

My last Annual Report concluded as follows:—
"With the increase of wires already provided and now in progress, the capacity of which the duplex apparatus will be able to double at small cost, it is believed that the constantly increasing volume of business, the growth of which will be stimulated by the present low and uniform rates, can be successfully handled with a less annual investment in new construction than has heretofore been necessary; so that, with competition checked, and in process of being extinguished, the percentage of expenses may be reduced and the patience of the stockholders rewarded at an early day by the resumption of regular dividends."

This prediction has already been verified. At the semi-annual meeting of the Directors, held on the 3d day of June last, a dividend of two per cent., payable out of the net profits for the quarter ended June 30, was declared. The profits for that quarter were \$762,029.44. On the 2d day of September another dividend, for the quarter ending September 30th was declared. The profits of the second quarter were \$832,993.85. The excess of profits for the two quarters over the amount required to pay the two dividends is \$243,875.

It is the intention of the Directors to continue the policy inaugurated at the June meeting, and to divide the net profits quarterly hereafter, and to provide otherwise for the payment of such property as it may be deemed advisable to acquire.

Respectfully submitted. WILLIAM ORTON,
President.

Original Articles.

The Fourth Cincinnati Industrial Exposition.

BY A VISITOR.

THE Fourth Cincinnati Industrial Exhibition was opened on the second of September and closed on the third of October. The arrangement of the building and the articles exhibited a decided improvement on either of those which have preceded it. The total number of entries, as compared with last year, showed an increase of about one third. There was a noticeable tendency towards a display of finer and more costly articles, exhibited in elegant glass cases with handsome and expensive surroundings, which added greatly to the attractiveness of the Exposition as a whole. The display of electrical goods was, in the aggregate, a good one. The Western Electric Manufacturing Co., of Chicago, Ill.; L. G. Tillotson & Co., of New York; E. Holmes, of New York; Eugene F. Phillips, of Providence, R. I.; David Brooks of Philadelphia, and others were represented by H. D. Rogers & Co. of Cincinnati; George H. Bliss & Co. of Chicago, Ill.; Watts & Co., of Baltimore, Md.; Partrick, Bunnell & Co., of Philadelphia, Pa.; and the Telegraph Supply and Manufacturing Co. of Cleveland, Ohio., by E. C. Armstrong, of Cincinnati.

The fact is that while the display as a whole was good there was not a single manufacturer or dealer in electric goods worthily represented. That there was any exhibition of such article was chiefly due to Messrs. Armstrong and Rogers, who were indefatigable in their efforts to have the list of premiums extended and amended so as to draw out, if possible, a full representation of all manufacturers of and dealers in electrical and telegraphic apparatus, yet these gentlemen, and McCullough, with his Fire Alarm Apparatus were the only exhibitors in this department, so far as the greater part of the visitors know.

Mr. Rogers has succeeded in advertising his concern, and Mr. Armstrong has made the City and Suburban Telegraph Association better known, if possible, but there has been but little substantial gain to anybody else. To give proper effect and secure the full advantage of the exhibition every exhibitor should make

himself individually known, and not have his contributions congregated in one space with a number of others, and entered in the name of one person. In the main hall there was a rectangular tower, neatly gotten up, some 25 feet in height, arranged with shelves around the four sides, containing about 1,500 packages of what are known as fancy groceries. As it was one of the most conspicuous objects in the Exposition no one could fail to see it, and it naturally attracted a great deal of attention, but out of the million people who have seen and admired that collection and the enterprise of the exhibitors how many of them recollect definitely anything but the name of the exhibitor and the business he is engaged in? It is the *tout ensemble* which invites inspection, and makes the lasting impression. Why should not the manufacturers of electrical and telegraphic goods follow a similar plan, each person or firm maintaining his or its individuality? I would advise that next year, and at the Centennial, that all who cannot or will not "hang their banner on the outer walls," so to speak, should save their time and money.

It is gratifying to notice the great improvement made in the design and finish of telegraphic goods, as shown at this exhibition. There were some articles exhibited worthy of special mention for their excellence. Messrs. Pearce & Jones, of New York, by Mr. Armstrong, exhibited a police and private line dial telegraph instrument, in use on the city and suburban wires, which attracted much attention. It was nickel plated, and beautifully proportioned and mounted. Scott's Annunciator, which is manufactured by Watts & Co., of Baltimore; and the new Annunciator Burglar Alarm and Bell Call, of the Telegraph Supply and Manufacturing Co., of Cleveland, Ohio; all in one case, which represented on one side a private residence from the outside, and on the other the annunciator, etc., were beautiful specimens of work. Messrs. Partrick, Bunnell & Co., of Philadelphia, also exhibited some very fine instruments. The case of goods from Geo. H. Bliss & Co., of Chicago, taken from the stock of E. T. Gilliland, of this city, embraced a full line of very handsome combination sets, box relays, students' sets, etc. This case doubtless secured the premium for best display for Mr. Armstrong. Mr. Rogers thought that justly he was entitled to this premium, and if he had had a larger space in which to arrange the many articles which he exhibited from the Western Electric Manufacturing Co. of Chicago, L. G. Tillotson & Co., of New York, and others, he might have been.

The display of goods from the Western Electric Manufacturing Co. was very beautiful. Messrs. L. G. Tillotson & Co.'s display was also a very good one, and their manufactures attracted attention, especially from telegraphers and those interested in telegraphic matters, by the excellence of the workmanship and finish they exhibited.

Mr. Frank Shaw's Morse Transmitter received special honor in being the only article selected and purchased at the Exposition by Baron Schwarz-Senborn, Director General of the Vienna Exposition.

L. C. Houore, of Cincinnati, exhibited a student's instrument, which consists of a wheel with the Morse letters in brass types on its periphery. Turning the wheel operates the key, which in turn operates the sounder. The correct sound of the letter thus produced is easily imitated with the hand. Another short cut to telegraphic learning. In other days the student's course was toilsome, rough and slow; but it is getting easier with modern inventions and appliances.

Mr. Henderson, one of the Commissioners, had a wire running from the main hall to the office of the United States Express Co., on Fourth street, to the railroad depots and his residence, enabling him, while devoting his time and labors to the cause of industry and science, to at the same time direct and regulate his business and social affairs. He and his wife and children, and all their men and maid servants are expert telegraphists, using the dot alphabet introduced by Mr. Armstrong. This is mentioned as an instance of what may be done by others using or needing private lines.

Doubtless every exhibitor would desire special mention of his or their show, but neither the available space in THE TELEGRAPHER or time of the writer will permit going into further details.

The Fourth Exposition has proved a great success, and reflects honor and credit upon the public spirited gentlemen who have devoted so much time and labor to make it the Exposition of the year. Every year this Exposition grows in importance, value and completeness, and nothing is left undone, regardless of cost, which will tend to make it worthy of the city, State and country.

Already the plans are being arranged for the Exposition of 1875, when every effort will be made to excel the splendid results already attained; and on that occasion Cincinnati will welcome all who may be able to visit her with every effort to make it pleasant and profitable for them, and maintain her reputation as the Great Exposition City.

The following are the awards of premiums for electrical and telegraphic articles, apparatus, etc., in full. Jurors—Messrs. L. C. Weir and E. T. Gilliland:

CLASS 60.

- 571. Best system of fire alarm telegraph, in operation, gold medal, National Fire Alarm Company.
- 574. Best fire alarm signal box, silver medal, National Fire Alarm Company.
- 577. Best telegraph battery, for force, durability and economy, silver medal, National Fire Alarm Telegraph Company.
- 578. Best electric light, silver medal, J. H. Wesling.
- 580. Best hotel annunciator, operated by electricity, silver medal, Telegraph Supply Manufacturing Company, of Cleveland.
- 586. Best switch for from four to twenty wires, bronze medal, Western Electric Manufacturing Company.
- 591. Best dial telegraph instrument, bronze medal, E. C. Armstrong.
- 592. Best lightning rod, bronze medal, David Munson, of Indianapolis.
- 760. Best general display of telegraph instruments and supplies, gold medal, to City and Suburban Telegraph Company.
- 761. Best type writer, silver medal, to the Western Electric Telegraph Manufacturing Company.
- 762. Best amateur telegraph instrument, bronze medal, to Charles Williams, Jr., Boston.
- 763. Best electric bell, bronze medal, to H. D. Rogers & Co.
- 765. Best electric medical apparatus, bronze medal, to the Western Electric Manufacturing Company.
- 766. Best insulator, bronze medal, David Brooks, Philadelphia.
- 767. Best electric clock, bronze medal, Howard Watch and Clock Company, New York.
- 768. Best insulated covered wire, for office use, bronze medal, E. F. Phillips, Providence, Rhode Island.
- 769. Best insulated covered wire, for line use, bronze medal, E. F. Phillips, Providence, Rhode Island.
- 770. Best electric gas lighting apparatus, bronze medal, A. L. Bogart, New York.
- 771. Best printing instrument, for private lines, bronze medal, to the Western Electric Manufacturing Company, Chicago, Illinois.
- 772. Best burglar alarm, bronze medal, E. Holmes, New York.
- 773. Best system telegraph call bells, for stores, etc., bronze medal, to H. D. Rogers & Co.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

Excellent Arrangement of Western Union Lines in Cincinnati.

CINCINNATI, OHIO, Oct. 26.

TO THE EDITOR OF THE TELEGRAPHER.

YOUR readers have been informed that a fine new telegraph office is being fitted up in Cincinnati by the Western Union Co. Some of the brethren here will no doubt give you a glowing pen picture of the gorgeous outfit as soon as the new quarters are occupied. But there is one matter I wish to mention that is generally overlooked by those who write up the descriptions. That is the live wires through the streets. This is an important point of the equipment, and one upon which great improvement might be made in many places. It seems that here in Cincinnati a decided departure has been made from the stereotyped Western Union catechism, so faithfully followed in the eastern cities. Compound wire is used where a large number of wires are required upon one set of poles. Every pole bearing any strain is securely guyed, and all set as erect as a plumb line can make them. These guy wires are placed where they will do the most good, the reverse of what is practiced in the East to a considerable extent. There is only one way to keep wires from becoming slack, and that is to thoroughly guy or brace all poles bearing any strain. They seem to have found this out in Cincinnati. A handsomer line we never saw than that just erected here by the W. U. Co. The beauty of it is, it will remain just as it is for years to come, unless damaged by accident. The compound wires are stretched very tight, and cannot be blown together. In cities where the poles are not properly secured and wires consequently very slack, much annoyance and delay occurs whenever a little breeze springs up. It is claimed by some that compound wire will soon rot and break when exposed to smoke. If this is true why not use a plain

steel wire for a few squares? The extra resistance would not be great enough to be taken into consideration on lines of any length. Glass insulators still are the favorite, judging from the fact that they are almost universally used. It seems to be the prevalent opinion here that Brooks' insulators are just what they are claimed to be when new, but after a short period they test no better than glass. We are inclined to accept this with a grain of allowance. If our Cincinnati friends will improve their insulation we venture the assertion that they will have some of the best lines to be found in this country. I could not find out during my brief stay here who the daring individual was that brought about this departure from Western Union doctrine. Whoever he is he deserves to be congratulated. Perhaps he is afraid of his scalp, and prefers to keep dark for the present. Mr. M. C. Bristol, I understand, has charge of construction. Whether he is responsible for this compound wire or not his skill in engineering and constructing city lines seems to be of a much higher order than that of some of his Eastern brethren. These Western fellows are far ahead of Eastern men in telegraph matters generally. If any one don't believe it let him take a trip West, passing through Pittsburg, Chicago, St. Louis, and returning via Cincinnati, Washington, Baltimore, Philadelphia, etc. In the three latter places, one will find a sad sight to behold—poles standing at all angles below 75 degrees, many of them carrying 20 to 50 wires, turning sharp corners without guy wires. The wires of course hang loose, and are constantly getting crossed. The sight reminds me forcibly of a little incident that occurred a few years ago. One of my neighbors had thrown out some cherries that had been soaked in a jar of liquor. A drove of turkeys happened to chance that way, and gobbled them up with a relish. The liquor, like Nasby's pills, attended strictly to business, and the way that drove of turkeys reeled around was comic in the extreme. They couldn't keep their heads erect without guy wires.

YANKEE ABROAD.

In the Wilds of Jersey.

TO THE EDITOR OF THE TELEGRAPHER.

I BELIEVE in my last I cut my letter short by stopping at Hackensack, on my trip over "The New Jersey Midland Railway," amongst the telegraph operators.

Jumping aboard of the train one is swiftly carried over to Paterson, where we find one of Mr. Bates' students, Mr. G. W. Post, "Q," a Hackensack boy, but we will leave both Post and Huntington, of down town office, until our letter of "Paterson operators," and we whirl on to Wortendyke station, the home of President Wortendyke. Here are located the shops of the company. At the shops office, "W. S." is Steve Jackson, "S," a very nice fellow, even if he is a nephew of the President. At the depot office, "W," we find our newly made temperance brother, James E. Flitcroft, "F," who is both agent and operator, as the y most generally are on this road. We hope Jim will not go back on his obligation.

Our young friend, Eddie Thompson, "Ed," from Pompton, takes care of the string at this office during the dark lonesome hours of the night. At the city office, "D. Y.," we find Manager Zabriskie, "Z," who is a whole souled fellow, but then I fear he can't be counted as one of us any more because he has went and gone and done it, and got murdered—married I suppose I should say. Well, God speed them, and may many "Qs" follow their union. Here we also find Abram C. Wortendyke, "B," another son of President W. He divides his time between "D. Y." and "Y. A." office, New York. We somewhat reluctantly leave this office and pass on to Pompton, where we find Mr. McIlroy, an old Erie man, who is both agent and operator. At Bloomingdale we find Mr. Hartwell, "A. X," agent and operator. Not being acquainted with him we cannot say much for or against him. We understand he comes from Unionville, New York. At night time we find here Tet Martin, "T," who is a good boy if he is lame. He has been on the road quite a length of time.

At Newfoundland we find E. B. Clay, "Cy," a Midlander. At Stockholm we find our friend Mr. M. P. Hendrickson, "Co." At Ogdensburg is Sands. He is lame, but that don't prevent the dear little girls from liking George. At Franklin Furnace we make connection, via Sussex Railroad, for New Town, New Jersey, and D. L. and W. R., M. and E. Div. At this place we find Mr. Smith, "S," his initials are "A. M.," whether he is an A. M. or not we know not. We have forgotten the name of the night man at this point. At Hamburg we find the popular agent and operator, E. K. Harris. At Deckertown we find the irresistible Joe Loomis, "Jo" the one armed fellow, but then Joe is one of those married fellows. At Unionville we come across another Mr. Smith, who runs a "thrashing machine" in his office, and has done so for the past fifteen years, being, as we understand, the first agent the Erie ever had at Un., when the Midland between

Middleton and Unionville was the Unionville Branch. At Johnson we come across another of Bates' students, a Hackensack boy, and a good boy he is too. His name is Harris, "W. D."

At Middletown we stop at Main street Depot, the western terminus of the New Jersey Midland. Here we find a brother of Tet Martin, who signs "J. E." He has his hands full in selling tickets and running the telegraph for three different roads—the two Midlands and the Erie. At the city office, "D. S.," we find another old Erie man, Mr. Merriman, who is a first class operator and receives as fast as you can send to him, very near, and he is also a first class fellow, both on and off the wire, in all respects.

As I am at the end of this road I will stop, but in conclusion I will say that there are three wires on this road. No. 1 is way railroad wire; No. 2 is for way commercial business, running only into principal offices between New York and Oswego; No. 3 wire runs from New York to Chicago, via Oswego. This wire is used only by the principal offices between Oswego and Chicago, no office on the Midland being allowed on it. Look out for my next. P'S AND Q'S.

An Organ Grinder Badly Sold.

ALBANY, OREGON, Sept. 30.

TO THE EDITOR OF THE TELEGRAPHER.

IN the days prior to Ben Halliday's advent in Oregon with his railroads our only public conveyances between Portland and San Francisco overlaid were six horse Concord stages of the Oregon and California Stage Co. At a good many of the towns along the line members of the telegraphic fraternity acted in the capacity of manager of telegraph and stage agent. This was the case at Corvallis, where our friend George Devondorf was agent, and at Albany, where "Webfoot" was the "observed of all observers," for there if a man wanted to be honored he must be a stage driver, agent or telegraph operator.

Well, one night as George was sitting in his office the stage drove up, and the driver, old George Weller, now of Albany, handed George out a large box which was quite "hefty," and wanted three dollars charges on it, as was the rule. George was dubious at first about "advancing," but thinking there *must* be "three dollars' worth" in the box, gave Weller the coin and chucked the box into the corner of the office, and thought no more of it for several days, when no one putting in an appearance to claim the box, and thinking perhaps some one was "playing" him, he concluded to make an examination of the contents, which he found to contain a complete *hand organ*, with the exception of the handle, which was gone. He got the handle replaced by a new one, and calling in a few of the "boys" and binding them to secrecy, told "Webfoot" if he wanted some fun to "come up to-night."

Now, fun of any kind was always my main weakness, and on this as on many former occasions, not knowing what it was to be till I went I took a seat on the stage and was soon in Corvallis. On arriving there George explained to me that I was to be the chief musician. He was to pack the organ on his back and I was to turn the crank! We started out in town, and created the biggest kind of a sensation—"serenading," as we facetiously termed the inflection upon the people. We kept the thing up till 3 A. M., when the stage came along and "Webfoot" went home, but George and the rest of "C's" boys kept the thing up for three or four weeks every night regularly, with the following good old tunes—all that the organ was capable of turning out: "Dan Tucker," "Arkansas Traveller," "Nelle Gray," and "Old Uncle Ned," till the citizens of that peaceful burgh got all the "music" they wanted; and after discovering that the boys could dodge all the bricks, pokers and flat irons thrown at them out of the windows, talked of passing a special ordinance against organs.

About this time there arrived on the stage from the north at 8 o'clock one night an old Italian organ grinder, who immediately claimed "our" instrument, and after paying George the three dollars he shouldered his organ and started up street to the City Hotel, under the piazza of which sat a crowd of men talking and enjoying the pleasant evening. He settled down to work and commenced grinding out a first class entertainment. After playing some time he "passed the hat around," but met with only laughter from the crowd. He started on grinding again, and after another half hour tried the hat business again, but with no better success. He kept it up till the crowd got disgusted and mad, and informed Mr. Organ Grinder that if he "didn't pick up and travel out of town right away they would murder him." The last seen of this poor imposed upon gentleman, he had his organ on his back and was *en route* for Albany and pastures new, wondering what kind of a town Corvallis was, not to appreciate music which would not "soothe the savage breast." WEBFOOT.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, OCTOBER 17, 1874.

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Single Copies Five Cents.

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(P. O. Box 5503.)

38 VESEY ST., New York.

EXTRA INDUCEMENTS TO OBTAIN SUBSCRIPTIONS FOR THE TELEGRAPHER.

It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST OF THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

THE TELEGRAPHER is the only generally recognized and established representative of the

TELEGRAPHIC FRATERNITY

in the United States and the Dominion of Canada, and, as such, has long enjoyed the confidence and approval of the great body of the telegraphers. Every effort has been and will be made to not only maintain but increase its

VALUE AND EFFICIENCY.

It is no ephemeral publication, but is a successful and firmly established journal, as is demonstrated by the fact that it has regularly appeared for

MORE THAN TEN YEARS,

having been enlarged from time to time, as its increasing patronage has warranted.

It is hoped that, recognizing the value and importance of the paper, the telegraphers generally will renew their efforts to immediately and largely

INCREASE ITS CIRCULATION.

To give everybody a chance to

PARTICIPATE IN THE PREMIUMS

the following offer is made:

FOR TWENTY SUBSCRIPTIONS,

to the person forwarding the names and money a No. 1 TELEGRAPH SOUNDER, or NOAD'S STUDENT'S TEXT-BOOK and CLARK ON ELECTRICAL MEASUREMENT, or any other Electrical or Telegraphic works of equal value.

FOR FIFTEEN SUBSCRIPTIONS,

a No. 1 Telegraph Key, or a set of F. L. POPE & Co.'s popular NONPAREL TELEGRAPH APPARATUS.

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a No. 3 TELEGRAPH KEY; new and elegant pattern.

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one of the new and popular SNAPPER SOUNDERS, introduced by Mr. R. W. POPE, with a HARD RUBBER KNOB.

For the Books offered above any other work or works of equal value will be sent if desired.

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with twenty cents additional for postage on Canada subscriptions. Remittances may be made by P. O. Order or Registered Letter, at the risk of the Publisher, and the expense of the order or registration deducted from the amount forwarded.

Those who send subscriptions for premiums should state that fact.

Subscriptions may be sent in as obtained, and more names added from time to time, and the Premium claimed for the whole number when desired.

All letters and remittances must be addressed and made payable to

J. N. ASHLEY,

Publisher.

P. O. Box, 5503.

The Annual Report of the President of the Western Union Telegraph Company.

WE print this week the Annual Report of President ORTON, of the Western Union Telegraph Company, which was made at the annual meeting of the Company on Wednesday last.

In order to give this report in the present number of THE TELEGRAPHER, we have been obliged to omit several columns of interesting matter which is in type, and was intended to appear this week. Correspondents and others whose contributions fail to appear as expected will understand the necessity of postponement of their favors. We shall have something to say about this report next week, but have neither time nor space to refer to it at greater length in this number.

Business and Telegraphic Prospects.

THE experience which we have been undergoing for the past year, and which is not yet completed, of coming down from the high prices and inflation attendant upon an irredeemable paper currency, and the enormous expenditures of the late war, while it is not pleasant, will in the end prove salutary and healthful. It was inevitable at any rate, and the longer it was postponed the more severe and distressing it would have been. The panic which a year ago so suddenly arrested us in what appeared to be the height of prosperity and business activity was by no means an unmitigated misfortune and evil. It has undoubtedly caused widespread distress, and has brought ruin and poverty upon a large number who supposed that they were either well to do, or at least certain of soon becoming so. It has given a severe check to many promising telegraphic as well as other enterprises, and has postponed the realization of the hopes and schemes which seemed on the eve of fruition.

For the past year there has been a steady and continual shrinkage of values which in some things has undoubtedly reduced them below an actual specie value. These will eventually recover their proper pecuniary status. Labor has declined less in nominal value than almost any other commodity in the market, but a large amount of labor is unemployed, and the price is gradually coming down in accordance with the general law.

Telegraphs and telegraphic enterprises have suffered with everything else in this process of contraction, and as our readers know there has been but comparatively a small amount of construction and reconstruction done during the past year. No new telegraph enterprises of any moment have been undertaken, and even less than the ordinary amount of repairs has been done upon existing lines. Economy has been the order of the day with telegraph companies; and, although as yet there has been no general reduction of telegraphic wages, yet the tendency in this direction has been unmistakable, if not as yet very marked.

While it is true that the telegraph business has been pretty good during the past three or four months, as reported by the companies, there has been wanting to a considerable extent the natural increase in such business which would have been noted had the business interests of the country not have been depressed. The resumption of dividends by the Western Union Company during the past year is a notable event, and it is authoritatively stated that these will not again be suspended. This has given additional market value to the stock of that company, which however has not as yet reached the figures which were obtained for it last year when no dividends were paid or immediately anticipated.

One unavoidable result of the tendency to cheaper rates—and telegraph rates have been reduced even in advance of other reductions—is the effort to increase the capacity of wires and instruments for the transmission of business—in other words to discover and develop fast telegraph systems. Duplex, quadruplex

and automatic telegraph systems, therefore, naturally are attracting much attention, and the introduction of fast systems in telegraph lines generally is a foregone conclusion. The duplex system has been and is being already used to advantage by the Western Union Company, and great results are anticipated from the quadruplex which is being experimented with on the lines of that company.

However beneficial these may prove, it is in our opinion to the automatic system that resort must be had eventually to solve the problem of low rates for telegraph service, and adequate pecuniary returns for such service. We had looked for a more general introduction of automatic telegraphy before this time in this country than has yet been accomplished, but for reasons which some of our readers well understand and appreciate this anticipation has not been realized. It is another illustration of the old proverb "that too many cooks spoil the broth," and we fear that our automatic friends while disputing over the shadow are losing the substance. The fault is not in the system, for it has been demonstrated to be capable of affording most satisfactory results on the lines upon which it has been tried.

With proper management and a consolidation of interests the lines of the Automatic Company may be extended with a renewal of business activity and a return of confidence which may be reasonably looked for at no distant day. To bring about the best results and with the least delay a consolidation of all the companies and lines now competing with the Western Union combination for the telegraph business of the country is undoubtedly most advisable, and we would again urge this upon the managers of these companies and lines.

With the reassembling of Congress we shall probably have a renewal of the postal telegraph agitation, which has already injuriously affected telegraphic extension and enterprises, and which, while there is no prospect of resulting in the taking of the telegraphs by the Government, still comes disinclination on the part of capital to invest in such enterprises. It would be a blessing to the telegraph companies and the country if the subject could be finally disposed of, but we fear there is not much hope of this at present.

On the whole the telegraphic situation may be regarded as promising and encouraging, and, with the revival of business and a renewed season of prosperity, the telegraphs will experience an impetus in their extension and development to which of late they have been strangers.

The American Electrical Society.

THE following circular has been issued by the committee appointed at the preliminary meeting of the Electrical Society at Chicago. It was the intention of the committee to send a copy of this circular to every person who would be likely to feel an interest in the objects of the society, or who would probably desire to become a member. Inasmuch as it is quite possible that many such persons may have been overlooked either by accident or inadvertence, it should be understood that this invitation is intended to be general, and is therefore published in THE TELEGRAPHER, in the hope that it may reach some who would otherwise have failed to see it.

CHICAGO, ILL., 1874.

DEAR SIR: A meeting of Electricians and Practical Telegraphers was held in this city on the evening of September 14th, for the purpose of taking preliminary measures toward the organization of a national association for the advancement of electrical science.

At this meeting it was decided to form such an association under the name of The American Electrical Society, and a committee of five was appointed to draft a suitable Constitution and By-laws for the government of the proposed society, and to issue a general invitation to all persons who are in any way interested in the objects of such a society, to attend a meeting for the purpose of forming a permanent organization, which meeting is to be held in this city on Wednesday, the 21st of October, 1874.

Believing that you are one of those who would probably feel desirous of participating in the organiza-

tion of the proposed society, as well as of becoming one of its active members, or would at least be likely to feel a friendly interest in its establishment and future prosperity, you are hereby cordially invited to be present at the above mentioned meeting, at which it is expected that a permanent organization will be effected and officers elected for the ensuing year.

It may be well to state that it is proposed to make the conditions of membership in the society comprehensive enough to include all persons interested in the advancement and diffusion of electrical knowledge, whether theoretically or practically. The project, so far as developed, has met with the warmest approval and coöperation of the leading electricians, telegraphers and telegraphic officials of the country, and it is hoped that it will also commend itself to your judgment and receive your support.

Should you approve of the project, but from any cause be unable to attend the meeting in person, the committee on organization would be grateful for any suggestions you may feel disposed to submit in writing, respecting either the plan of organization, or the best means of promoting the permanent welfare of the society.

All communications, including applications for membership, forwarded to the undersigned, chairman of the committee on organization, will receive due consideration.

C. H. SUMMERS,
Room 8, Union Building.

A Change of Location and Business.

Mr. WALTER P. PHILLIPS, who is well and favorably known to the readers of THE TELEGRAPHER, under the *nom de plume* of JOHN OAKUM, by his interesting contributions to his column, and also as a first class telegrapher generally, has accepted the appointment of Assistant Agent of the New York State Associated Press, and has moved across the street from the main office of the Western Union Telegraph Company to the office of the New York Associated Press, where he may be found during the day engaged in preparing the telegraphic news and dispatches for the press of the State outside of this city. The journalistic ability and proclivities of Mr. PHILLIPS have been exhibited in his connection with various newspapers for several years past, and have indicated that his proper sphere was in connection with journalism. Of untiring industry and excellent appreciation and acquaintance with the requirements of the press in the matter of news, the State Press is to be congratulated on having secured the services of so able, faithful and capable an agent in this city.

Phillips' Insulated Wires.

We take pleasure in calling attention to the advertisement of the insulated wires of Mr. EUGENE F. PHILLIPS, of Providence, R. I., which will be found in this paper. Mr. PHILLIPS manufactures every description of insulated wires, from line wires for outside telegraphic use to the finest magnet wires. The excellence of the wires manufactured by him is generally recognized by telegraph companies and others who have occasion to use such wires, and he has established a large business in his specialty, which is constantly increasing as his wires become more widely and practically known. He furnishes none but the best wires, and purchasers may rely upon any article procured of him, or of his manufacture, proving to be fully as good as it is stated to be.

L. G. Tillotson & Co.

THIS enterprising firm continue to do an extensive business in electric and telegraphic apparatus and supplies, as well as railway supplies, and their headquarters at No. 8 Dey street is one of the busiest places that can be found in this city.

They have a fine display of electrical and telegraphic apparatus at the Fair of the American Institute in this city, and also at the Philadelphia Exhibition. We understand, by the way, that they contemplate soon opening a branch establishment in Philadelphia, in order to more conveniently meet the requirements of their increasing trade in that section.

THE Government of Chili now possesses 4,900 kilometers of telegraph line.

Premium Awarded to the Brooks Insulator.

AS WILL be seen in the report of the premiums awarded at the recent Cincinnati Exhibition, that of the medal for the best telegraph insulator was given to Mr. DAVID BROOKS of Philadelphia, for his improved paraffin insulator. This is another proof of the superiority of these insulators, which have already secured flattering approval and endorsement wherever they have been used. We understand that notwithstanding the general dulness which has prevailed in telegraphic construction during the present year Mr. BROOKS has done and is doing an excellent business in the manufacture and sale of his insulators.

Personals.

Mr. S. C. RICE, one of the oldest and most experienced operators in the Albany, N. Y., Western Union office, has been promoted to the position of assistant chief operator.

On account of failing health Mr. S. C. SHELTON, who for the past five years has held the position of head bookkeeper in the Albany, N. Y., Western Union office, has resigned.

Mr. JOHN CARROLL has been appointed Assistant Superintendent of the Fire Alarm Telegraph in Albany, N. Y., vice Mr. WM. J. CULL, promoted to the Superintendency.

Mr. W. H. HARTNEY, Manager of the Harrisburg, Ontario, Canada, office of the Great Western Railway, and Montreal Telegraph Company, is enjoying a few weeks holiday among his friends, for which Canada at this season of the year presents many advantages. It is hoped that he will realize fully the pleasure anticipated, and resume his duties much refreshed and reinvigorated.

Mr. HARRY H. HAMILTON has been appointed Chief Operator of the Penna. & N. Y. Division lines, L. V. R. R., at Towanda, vice Mr. R. M. BILLINGS, resigned to engage in other business.

Mr. SAMUEL W. EYSENBACH has been transferred to Tunkhannock day office, Pa. & N. Y. R. R., from night office, Penn Haven Junct., L. V. R. R.

Mr. FRANK KING, operator at Tunkhannock, has withdrawn from the service and gone home on account of ill health.

Mr. L. C. MANN has taken the position of night operator at Penn Haven Junct., vice Mr. EYSENBACH, transferred.

Mr. S. S. COLTON has been appointed ticket agent and operator N. J. Midland Railway at 68 Broadway, Paterson, N. J., vice Mr. F. M. HUNTINGTON transferred.

Mr. S. W. HARRIS, formerly of Johnson's station, N. Y., N. J. Midland Railway, has been transferred to Broadway station, same road at Paterson, N. J., as agent.

Mr. R. C. LAVERY has returned (after a year's absence) to the position of Chief Operator of the Lehigh Valley Railroad lines at "Ch" office, Mauch Chunk, Pa., a position held by him for several years. The operators welcome him back.

The Telegraph.

By Cable.

TELEGRAPHIC COMMUNICATION FACILITATED IN TURKEY.

CONSTANTINOPLE, Oct. 13.—The Government of Turkey has withdrawn its prohibition of the transmission of cipher messages on the telegraph lines in Turkey.

Annual Meeting of the Western Union Telegraph Company.

THE annual meeting of the stockholders of the Western Union Telegraph Company was held at the office of the company, 145 Broadway, New York, on Wednesday, October 14th, at which the following were elected as directors of the company for the ensuing year: Messrs. William Orton, James H. Bancker, Alonzo B. Cornell, Harrison Durkee, Norvin Green, Joseph Harker, Edwin D. Morgan, Augustus Schell, W. K. Thorn, C. Vanderbilt, Frank Work, Chester W. Chapin,

Wilson G. Hunt, David Jones, C. Livingston, James Milliken, Levi P. Morton, George H. Mumford, O. H. Palmer, George M. Pullman, E. S. Sanford, John Steward, Moses Taylor, Daniel Torrance, W. H. Vanderbilt, W. R. Vermilye, E. B. Wesley, Stillman Witt, E. D. Worcester.

The Atlantic and Pacific Line from Chicago to Omaha.

THE new line of the Atlantic and Pacific Telegraph Company from Chicago to Omaha, by the route of the Chicago and Rock Island Railroad, has been completed and is in operation. This gives the A. & P. Company communication direct from New York to the Pacific Coast over its own wires. Heretofore the connection between Chicago and Omaha has been made over a line leased by the Western Union Telegraph Company to the Union Pacific Railroad Company. This line has been built under the personal superintendence of Mr. George H. Bliss, of Chicago, and has been put through in a very reasonable time, and has been thoroughly and substantially built—Brooks' insulator having been used. The company are to be congratulated on this important addition to their facilities. At Grinnell, Iowa, by means of the new line, the A. & P. Company connect with the Hawkeye Telegraph Company.

The following is a list of the offices opened by the A. & P. Company on this new line:

Washington Heights, Ill.	Sheffield, Ill.
Joliet, "	Genesee, "
Morris, "	Moline, "
Omaha, Neb.	Rock Island, "
Lasalle, Ill.	Davenport, Iowa.
Wilton, Iowa.	Des Moines, "
Iowa City, "	Stuart, "
Marengo, "	Atlantic, "
Grinnell, "	Avoca, "
Mitchellville, "	Council Bluffs, Mo.

On Hawkeye Company's line:

Mason City, Iowa.	Marshalltown, Iowa.
Rockwell, "	Gilman, "
Hampton, "	Grinnell, "
Ackley, "	Searsbow, "
Steamboat Rock, "	New Shara, "
Eldora, "	Oskaloosa, "
Union, "	Eddyville, "
Liscomb, "	Coal Field, "
Albion, "	Albia, "

Resignation of Operators from Manhattan Quotation Company.

ON the 5th inst. notice was given to the Supt., operators, etc., of the Manhattan Quotation Company, that their salaries had been reduced 25 per cent. from the first of October. This was done without previous intimation of such a purpose, and as it was the second reduction which had been made on a portion of them, it was naturally not favorably regarded. On the 10th inst. payment being refused by the company, except at the reduced rates, seven of the employe's of the company resigned and quit work. Two of these subsequently reconsidered and remained. Five of them, including the Superintendent, are still out, and do not propose to return. Their places have been temporarily supplied from the force of the Atlantic and Pacific Telegraph Company.

Those who quit the service of the company desire it to be understood that this is not a strike, or intended as such on their part. They consider that the company, in reducing their salaries without previous intimation or consultation with them, and dating such reduction several days previous to informing them of the fact, has not used them properly, and that as they were preëmporarily refused payment at the previous rate, even temporarily, they were under no obligation to give previous notice of their resignation.

Appropriate and Deserved Presentation to Mr. Gerritt Smith.

LAST Saturday evening the operators of No. 145 Broadway, New York, visited the room of Mr. J. D. Reid, where it had been arranged to have Mr. Gerritt Smith, late senior chief, in waiting. Mr. Smith's presence was the result of a *ruse*, and the demonstration was to the end of presenting him with an elegant gold watch, made by the Waltham Watch Company, and appropriately inscribed, and which had been purchased by subscription at the instance of Mr. Thomas J. Landy. The presentation speech was made by Mr. Joseph L. Edwards, a printing operator, and was a graceful and pleasant effort. Mr. Smith was quite overpowered by his emotion, but rose at the end of a few seconds and spoke in a most appropriate manner, disclaiming all claim to such kindness at the hands of his old associates, and assuring those assembled that the foundation of the feeling existing between him and them was laid and substantiated by themselves, from

none of whom he had ever received an ungentlemanly word during his connection with the operating department. Mr. Reid was invited to speak, and alluded briefly, but feelingly, to Mr. Smith's career, and his great value to the company in the position to which he has just been appointed. He congratulated the gentleman on the kindly feeling entertained toward him both as shown in the remarks of Mr. Edwards, in behalf of his fellow craftsmen, and in the bestowal of a tangible and beautiful memento of esteem. A general hand shaking, followed by three cheers and a tiger for Mr. Smith, closed the demonstration, which will long be remembered as one of the most gratifying events connected with the history of the soon to be abandoned, but ever to be cherished and famous institution, "No. 145."

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AND INCLUDING OCTOBER 10, 1874.

ASSESSMENT NO. 68.

6,	8,	51,	55,	56,	59,	61,	67,	72,
80,	88,	89,	90,	108,	114,	121,	129,	133,
134,	141,	142,	144,	153,	175,	176,	177,	201,
202,	220,	228,	230,	235,	244,	254,	257,	267,
274,	176,	278,	279,	281,	282,	283,	285,	286,
344,	351,	367,	380,	391,	392,	393,	394,	406,
413,	414,	416,	425,	430,	431,	434,	463,	516,
520,	526,	535,	548,	549,	576,	577,	587,	600,
603,	622,	649,	662,	663,	664,	665,	669,	672,
678,	680,	703,	750,	751,	756,	787,	791,	799,
830,	831,	855,	874,	876,	901,	934,	977,	995,
1011,	1023,	1024,	1040,	1055,	1081,	1085,	1167,	1173,
1195,	1196,	1200,	1225,	1548,	1252,	1260,	1266,	1273,
1276,	1304,	1329,	1336,	1359,	1364,	1365,	1368,	1385,
1389,	1390,	1391,	1394,	1398,	1412,	1440,	1444,	1453,
1482,	1516,	1518,	1550,	1560,	1582,	1601,	1607,	1608,
1615,	1625,	1630,	1634,	1635,	1656,	1658,	1692,	1695,
1707,	1721,	1728,	1729,	1790,	1791,	1809,	1810,	1811,
1812,	1815,	1817,	1818,	1831,	1835,	1847,	1869,	1874,
1881,	1607,	1911,	1913,	1914,	1915,	1934,	1938,	1968,
1999,	2000,	1001,	2024,	2028,	2029,	2036,	2038,	2040,
2044,	2048,	2057,	2083,	2119,	2137,	2160,	2162,	2172,
2194,	2195,	2196,	2202,	2203,	2204,	2205,	2206,	2208
2212,	2214,	2216,	2223,	2224,	2238,	2241,	2242,	2243,
2276,	2278,	2290,	2294,	2295,	2296,	2297,	2298,	

ASSESSMENT NO. 66.

185,	186,	187,	438,	481,	527,	652,	695,	697,
705,	725,	869,	899,	908,	915,	920,	1071,	1103,
1289,	1400,	1504,	1566,	1557,	1559,	1570,	1600,	1610,
1611,	1612,	1613,	1653,	1670,	1678,	1690,	1691,	1741,
1945,	1946,	1847,	1974,	1987,	1995,	2151.		

MISCELLANEOUS.

No. 67.—33, 78, 952, 1144, 1267, 1970, 2262.

No. 65.—19, 1182, 1605, 1657, 1978.

No. 63.—800, 1650.

Members of the Association will please take notice, that an acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

OCT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
8	79% ... 80%	...	39 ... 40
9	79 ... 80%	...	40 ... 41
10	78% ... 79%	...	39 ... 40
12	79% ... 80%	...	40 ... 42
13	79% ... 80%	...	40 ... 40
14	79% ... 78%	...	41 ... 41

Died.

SHEA.—At Troy, N. Y., October 7th, 1874, of hemorrhage of the lungs, Mr. VINCENT A. SHEA, operator in the Western Union Troy, N. Y., office, aged 21 years.

GEO. H. BLISS & CO.,
TELEGRAPH MACHINERY AND SUPPLIES
HOTEL ANNUNCIATORS,
 Electrical and Electro-Medical Apparatus,
 41 THIRD AVENUE, Chicago, Ill.

OFFICE OF EUGENE F. PHILLIPS,
 20 CONDUIT STREET.

PROVIDENCE, R. I.,
 September 15, 1874.

GENTLEMEN: I take pleasure in calling your attention to my
PATENT FINISHED INSULATED TELEGRAPH WIRE.

I claim this to be the best braided wire manufactured, and I believe it is universally acknowledged so throughout the country by all the large Telegraph Companies and Telegraph Supply dealers. Its points of superiority are:

- 1st. Its excellence of outside finish.
- 2d. The toughness of the Patent Compound with which the braid is saturated.
- 3d. By its polished outside finish, its adaptability for shedding rain and sleet.
- 4th. On account of the nature of the compound it can be laid directly against any wall or paper without staining or greasing it, which cannot be said of any other paraffine wire.

It is the only braided wire made, which, after it has been up for any lengthtime, will, with ordinary dusting, like any piece of polished furniture, look bright and fresh as when first put up. All other wire, regardless of its color, when first put up, will, in a short time, become dusty and dirt color, making an unsightly thing in an office, where mine, with its brilliant, fresh color, is an ornament.

The toughness of the compound, which also makes it capable of taking this splendid polish, makes it the most durable braided wire made. It is especially desirable for outdoor use, as the rain cannot beat the compound off, and its smooth surface prevents the snow and sleet from sticking to it.

A grease streak along the wall or paper behind the wire running into a nicely fitted up Broker's office, does not make him feel—well, good natured. This can be avoided by using this wire.

I also make it in cables of any number of conductors at the regular price for a single wire.

It is finished in any desirable color or plaids, with a light or heavy insulation, at the following prices:

No.	BROWNE & SHARPE'S GAUGE.	8. Price, per lb.
8.	"	\$0 85
9.	"	90
10.	"	90
11.	"	95
12.	"	95
13.	"	95
14.	"	1 00
15.	"	1 00
16.	"	1 10
17.	"	1 10
18.	"	1 20
19.	"	1 30
20.	"	1 40

Finer numbers at special prices.

Galvanized Iron Wire.....\$125 00 per mile.
 American Compound Wire..... 3 1/2 cents per foot.

Each covered with three heavy linen braids, and well saturated for outside use.

Ten per cent. discount in quantities not less than 10 lbs.

Fifteen per cent. discount in quantities not less than 20 lbs.

A liberal discount for larger orders.

Patented November 18, 1873.

I also manufacture plain cotton or linen covered wire, or will saturate the braid of the same with paraffine, shellac or paint. This may be covered with a wind and braid outside, or two braids, or a single braid, as the customer may wish.

This, if applied, is rubbed smooth on the outside, and I claim and believe is as good as any braided wire made, outside of my Patent Finished.

No.	BROWNE & SHARPE'S GAUGE.	8. Price per lb.
8.	"	\$0 75
9.	"	80
10.	"	80
11.	"	85
12.	"	85
13.	"	85
14.	"	90
15.	"	90
16.	"	1 00
17.	"	1 00
18.	"	1 00
19.	"	1 10
20.	"	1 10

Finer numbers at special prices. Discount same as on Patent Wires.

I also manufacture a RUBBER COVERED WIRE, which will not grow stiff and crack off in cold weather, or grow soft in the hottest weather.

By my process of putting this rubber on the wire will be found in the exact centre every time. After the rubber is put on it is vulcanized, and then covered on the outside with a braid

and finished, and is suitable for under ground, under water, or any outside or other purposes.

No.	BROWNE & SHARPE'S GAUGE.	8. Price, per foot.
8.	"	\$0 13
9.	"	0 12
10.	"	0 11
11.	"	0 10
12.	"	0 9
13.	"	0 8
14.	"	0 7
15.	"	0 6 1/2
16.	"	0 6 1/2
17.	"	0 6 1/4
18.	"	0 6
19.	"	0 5 1/2
20.	"	0 5 1/2

Finer numbers at special prices. Discount same as on Patent Wires.

I have also just put in new and the most approved machinery for the purpose of making Magnet Wires, and feel satisfied that I can furnish as good as any to be had in the market at the following prices:

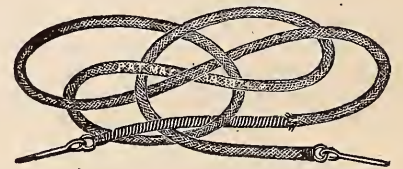
MAGNET WIRES,

BROWNE & SHARPE'S GAUGE,

EITHER PLAIN, PAINTED OR PARAFFINED.

No.	COTTON COVERED.	SILK COVERED.
8.	"	\$0 60
9.	"	0 60
10.	"	0 65
11.	"	0 65
12.	"	0 70
13.	"	0 70
14.	"	0 75
15.	"	0 75
16.	"	0 75.....\$1 80
17.	"	0 80..... 2 00
18.	"	0 80..... 2 10
19.	"	0 80..... 2 20
20.	"	0 85..... 2 30
21.	"	0 90..... 2 40
22.	"	1 00..... 2 50
23.	"	1 10..... 2 60
24.	"	1 20..... 2 70
25.	"	1 40..... 2 90
26.	"	1 40..... 3 00
27.	"	1 50..... 3 20
28.	"	1 50..... 3 40
29.	"	1 90..... 3 55
30.	"	2 00..... 3 70
31.	"	2 10..... 3 90
32.	"	2 20..... 4 05

Finer numbers at special prices. Discount same as on Patent Wires.



I also manufacture a **PATENT ELECTRIC CORD**, which is pronounced by all to be the most flexible of any in the market, and the best suited of any made for Switch Boards, Medical Batteries, etc.

Silk covered, price per foot.....\$0 06
 Cotton or Linen covered, price per foot..... 0 05

Ten per cent. discount on 100 feet. Fifteen per cent. discount on 200 feet.

GENERAL REMARKS.

All wire used by me is made to my special order, and is the best that can be had in the market.

As one of the largest dealers told me a short time ago, "Your wires have come into the market on their merits alone, and we have been forced to keep them," so you may feel sure I shall feel chary of that honor, and shall be very careful to furnish none but the very best in my power.

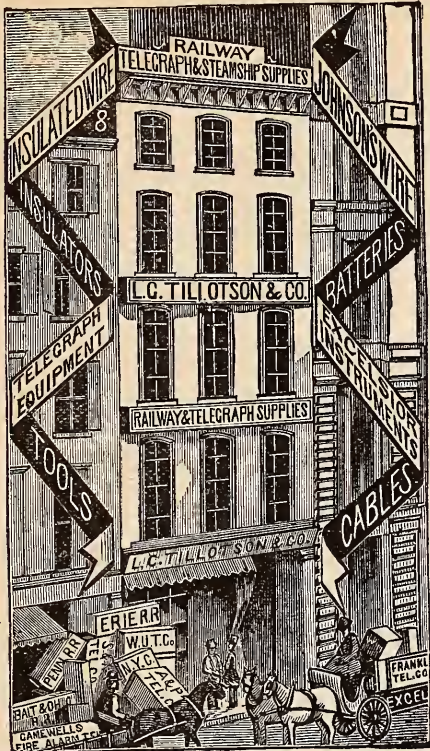
I could give a long list of testimonials, but I will still depend on the "merits" of the wire, and respectfully solicit your patronage.

Your obedient servant,

EUGENE F. PHILLIPS.

These Wires can be had at my prices of

- L. G. TILLOTSON & CO.....New York.
- CHARLES T. CHESTER.....New York.
- F. L. POPE & CO.....New York.
- PATRICK, BUNNELL & CO.....New York.
- PATRICK, BUNNELL & CO.....Philadelphia.
- CHARLES WILLIAMS, JR.....Boston.
- THOMAS HALL.....Boston.
- GEO. H. BLISS & CO.....Chicago.
- H. D. ROGERS & CO.....Cincinnati.
- GEO. C. MAYNARD.....Washington.
- WATTS & CO.....Baltimore.



BUY THE BEST.

IF YOU WANT
EQUIPMENT
FOR A
TELEGRAPH LINE,
ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK.

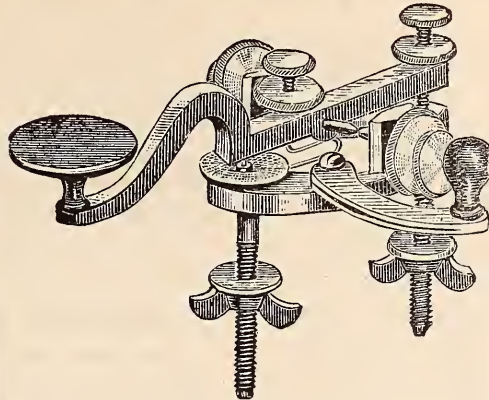
SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all
instruments of our manufacture.

L. G. TILLOTSON & CO.,

8 Dey Street, N. Y.

WATTS & CO.,
BALTIMORE, MD.



PATENT CIRCUIT-CLOSER KEY.

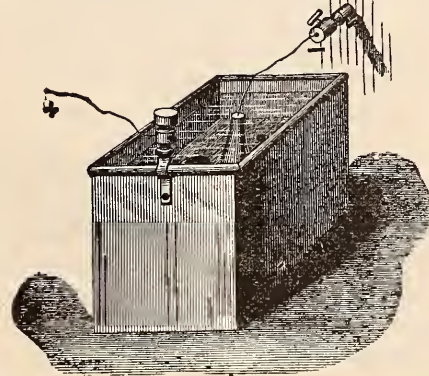
Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit
or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
Superintendents and Purchasing Agents are invited to examine
our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,

BROOKS' OR GLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
at the same prices offered by other establishments.

Our new Illustrated Catalogue contains some useful information
for Superintendents and others interested in the Science of
Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for
manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic
and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the
battery. Sulphate of copper is the only chemical required to be
used.

These Batteries have been fully tested during the last year,
although only recently offered for sale, and have proved to be
superior to any other as regards efficiency, economy and dura-
bility. When once set up they require no attention for from
four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.
No. 1 is a large square cell, and can be used as a local or for
running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a
savings of nearly one half in cost.

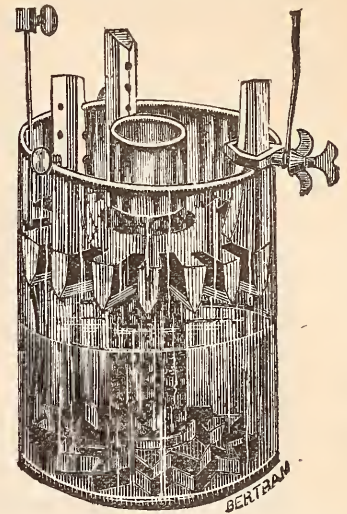
No. 2 is a round cell, designed for main line. Price, \$2.
Descriptive circulars and price list forwarded upon applica-
tion to

F. L. POPE & CO.,

P. O. Box 4508.

38 VESSEY STREET, N. Y.

THE BALTIMORE BATTERY.



Acknowledged to be **SUPERIOR** to any other for Telegraph
purposes.

Every comparative test made the past year resulted in the
adoption of our Battery.

A prominent Superintendent writes: "My impression is the
Baltimore is to be the Battery of the future." He has others in
circuit, to determine the value of each in service.

It is now in use on commercial and railroad lines, stock report-
ing telegraphs, private lines. Superintendents fire alarm tele-
graphs recommend it as the most reliable they have used.

Thousands furnished Gold and Stock Telegraph Co. of New
York, who use no other.

For closed circuit it is without a rival.

All kinds of Battery and Battery material for

WATTS & CO.,

47 HOLLIDAY ST., BALTIMORE.

OUR ILLUSTRATED CATALOGUE NOW READY.

A **AMERICAN COMPOUND TELEGRAPH**
LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the **COMPOUND TELEGRAPH WIRE** compared
with Iron, consists in its **LIGHTNESS** relative **TENSILE STRENGTH.**
CONDUCTIVITY DURABILITY, EFFICIENCY AND RELIABILITY.

Address, American Compound Telegraph Wire Co.

ALANSON CARY, Treasurer,

No. 234 West 29th St.,
New York.

C **CHEAP TELEGRAPHY BY THE AUTO-**
MATIC TELEGRAPH CO.

—:01—

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.
Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

S **SECOND HAND INSTRUMENTS.**

A large lot of well polished and good working

RELAYS, REGISTERS
AND CUT-OUTS,

GEO. H. BLISS & CO.,

41 Third Avenue, Chicago, Ill.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,

San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The Automatic Signal Boxes.

Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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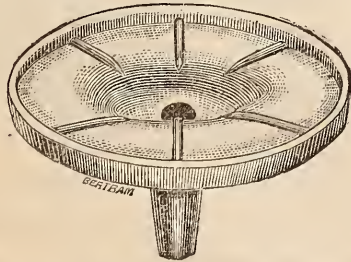
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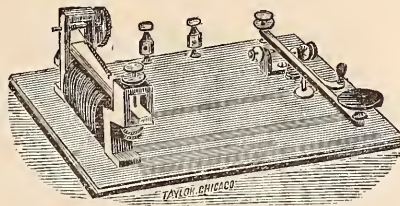
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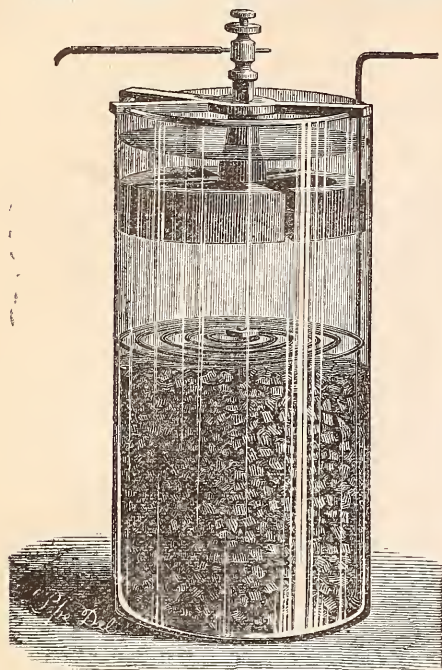
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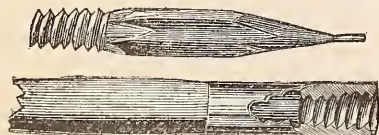
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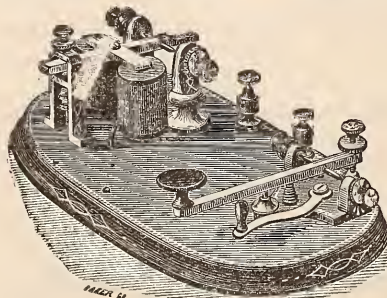
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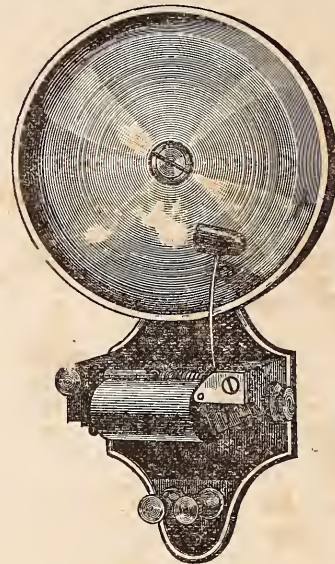


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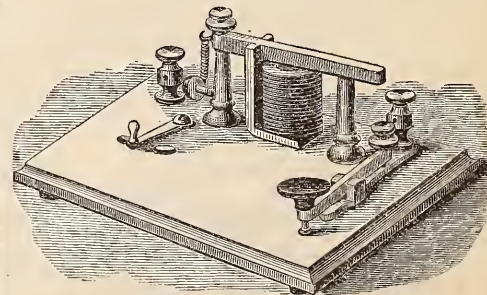
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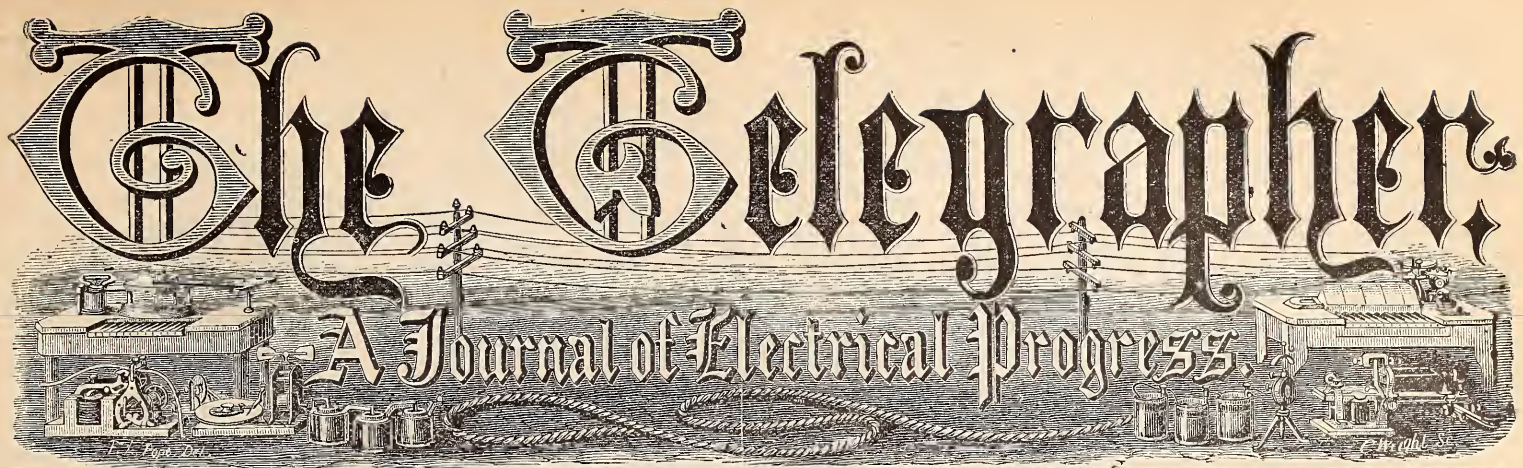
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Vol. X.

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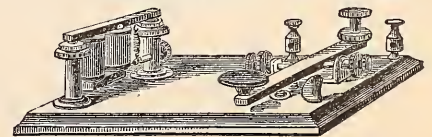
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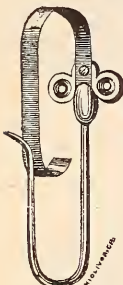
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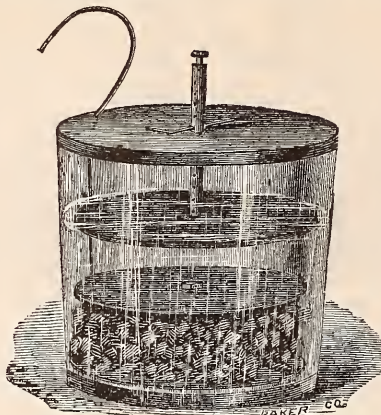
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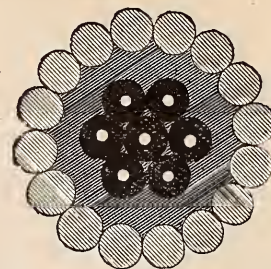
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THE TELEGRAPHER

A JOURNAL OF
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J. N. ASHLEY, PUBLISHER.

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Original Articles.

Telegraphing as a Government Institution.

It has been a favorite idea with a not inconsiderable number in this country, as well as in Europe, that the telegraph system should be administered by the Government as a part of its regular functions. Accordingly, strenuous efforts have been made for several years past to induce Congress to take over the telegraphs of the country, and carry them on in connection with the Post-office Department. The subject just now is in a quiescent state, but the purpose has by no means been abandoned, and efforts will be renewed with the reassembling of Congress next winter to make progress towards the realization of the plans for the purchase and management of the telegraphs by the Government. Those who suppose that the danger of such action is past deceive themselves. It is true that at the present time there is apparently little interest felt in the subject, and it is equally true that the idea of a Government control and management of the telegraphs has never been a popular one in this country. Still it has powerful endorsement, and its friends are earnest and persistent in their advocacy of and efforts to secure such a telegraphic management and control.

Aside from the want of popular approval there are many reasons which interfere with the realization of the desires of those who are urging this matter. One of the most serious objections to the project is undoubtedly the great expense which it will entail in the first place upon the treasury to purchase existing telegraph interests. The experience of Great Britain in this direction has been a salutary warning to this country. Even granting that an extravagant price was paid for the telegraphs by the British Government, it is evident that upon any reasonable and fair basis the telegraphs in this country must cost a very large sum, and one which the treasury is in no condition at present to incur. The expenses to which the Government would be subjected in extending (as it inevitably must) the telegraph system to meet the popular demands if it became a Government affair, and in carrying it on would be enormous. In this respect the experience of our British cousins is suggestive and instructive. With the limited extent of the lines in that country, and the dense population, the comparatively cheap rates of telegraphic labor, and the other advantages which it has over this country, it has been demonstrated that the telegraphs can only be operated at an actual loss to the Exchequer. While the lines under private management are remunerative, the Government lines are a constant and increasing expense to the national treasury, and this is true not only of the British Government telegraph system, but of those of the Continent as well. How much more then would this be the case in this country, where the lines are so long, and a considerable portion of the country so thinly settled.

There is another and even more serious objection in the popular mind, and one which has had a very material effect in preventing popular approval and favorable action on the postal telegraph projects, so-called, and that is the conviction that Government administration of the telegraphs would be anything but satisfactory. Government business is not usually so well done here as to make the people desirous of adding to the duties of Government and government officials the administration of the telegraphs. There is here, as in every country, a party which considers it the province of the Government to engage in all branches of business that extend throughout the country. They desire to see banking and railroad transportation as well as the postal and telegraph business monopolized by the Government. They do not believe in the democratic maxim that "that Government is best which governs least," but would have the official control extend to all departments of business. In short they believe in a centralized and paternal government, and would cast upon it the management and responsibility regardless of the inevitable tendency of such a government to undermine and destroy the liberties and independence of the people. While they denounce monopolies unsparingly they desire to build up a Government monopoly which would be more odious

and more to be dreaded than any private monopoly could possibly become. It has been fully demonstrated that while the telegraph business remains under private management and control a permanent monopoly is impossible. Were all existing telegraph lines in this country this year consolidated into one great corporation, experience has shown that new companies would be organized and competing lines under construction within a few months. The money which has been lost heretofore has been very considerable in amount, yet the public have repeatedly contributed the funds requisite to supply new competing lines when old ones have been absorbed; and, notwithstanding all the consolidations of lines and companies into the Western Union Company, there are to-day as great an extent of competing lines in existence as ever before, and new ones are being built, and the system is being constantly extended and increased. There would be now a much greater extent of such lines in existence had it not been for the continued agitation of the Government telegraph projects during the past five years. Unquestionably, reasonable competition in telegraphy is best for the public, and will secure, at moderate cost, better and more satisfactory telegraph service than would be possible under a Government monopoly.

It is not intended to discuss this subject in detail, and for that reason no statistics have been introduced to show the working and results of Government telegraphing in other countries. The subject, it is true, is a trite one, and has been discussed until most readers are weary of it, but the danger of advantage being taken of the indifference of the public to it, to secure action which shall commit the Government to this folly should be realized, and it can only be averted by calling attention to the matter from time to time. The President in his annual messages has strongly recommended to Congress favorable action upon it, and as it is well known it was the pet idea of the late Postmaster General, Mr. Creswell, to have the adoption of the postal telegraph the crowning honor of his administration, and to that end he urged it upon Congress in season and out of season, but without success. What the opinion of the new Postmaster General upon the subject may be is not known, but it is understood that as yet he has not committed himself either way. As he was formerly a practical telegrapher and knows something of the telegraph business, he may reasonably be expected to consider the matter more intelligently than his predecessor. If he will use his influence to finally dispose of it, during his administration of the Post-office Department at least, he will do a signal service to Congress, the public and the telegraph interests.

Tom Larkins, the Messenger.

BY LEMONS.

WHEN he came to work at the depot office he was about fifteen years old, but very tall for his age, and his cheek corresponded with his height. He had scarcely been in the office two weeks before he knew everybody around the depot, and all the conductors and engineers on the road. He called them all by their first name, and was as familiar with them as though he had known them for years.

It was wonderful the stories he told of his abilities as a telegrapher. He said he frequently sent so fast it took two men to receive from him, and if there happened to be a wreck or any trouble on the road that it became necessary to rush business, he could receive on two wires at the same time. He never told these things when Barns the operator was around, but as Barns was experimenting with Dutch Bill's beer most of his time in a saloon around the corner, Larkins had plenty of opportunities of relating his wonderful feats.

The moment Tom saw any one looking in the office window, that moment Thomas would grab hold of the key of a short circuit there was in the office for practicing purposes, and commence a terrible racket with it; turning up his old magnet as high as it would go, then turning it away down again, muttering "plug," and looking very mad all the while as though the operator he was working with was doing his share of the work very unsatisfactorily.

In this he tried to imitate Barns, the operator. He had frequently noticed Barns getting very angry when he was working, and swearing if he had a pistol he would shoot that man at X.

Nothing pleased Tom more than to pass himself off as the manager of the office. He was always ready to receive messages at the window, and to tell the person sending the same that he would personally superintend the sending of the message, and have a reply as soon as possible.

One day Barns had a quarrel with Garvey, the operator at Bankton, having insulted him by requesting him to go back to blacksmithing where he would shine, as he would never be able to display his talents in this business. This touched Garvey in a tender spot, as he had at one time studied for a blacksmith, but was discharged on account of his experiments in trying to make the bellows blow themselves. He told Barns he

would make him swallow that before two hours was over; he said he would be down on No. five, which reached Barns' station at three o'clock, and he would return on the up train at three twenty, and he added if you are a man be at the train. Barns told him he would be there, and would also have a stretcher to send him back home on. "and for fear," continued Barns, "I should happen to let myself out and give you one with my left, in my excitement, I would advise you to arrange your earthly affairs, and be prepared for the worst." Garvey didn't deign a reply to this. About five minutes before the train was due Barns says to Tom, "I am going over home to see my sick mother; only be gone about half an hour; take charge of the office until I return."

Tom says all right, and swells himself out to his idea of the necessary proportions of a manager, with his feet cocked up on a chair, and a cigar in his mouth.

Shortly after the train comes in, Garvey steps off, goes up to the telegraph window and looks in; sees Tom with his feet up, and looking exceedingly consequential, says to him, "Are you the operator?" Tom replied that he was. In walks Garvey and says my name is Garvey, from X, at the same time grabs Tom by the back of the neck, shakes him up, hitting him one, two, in the face, bangs his head down on the table two or three times, then throws him in a corner, walks off, and gets on the return train with the idea that he has given that man Barns what he deserves.

But Tom! You never saw such a change as there was in that boy. He never aspired to be the manager after that. He didn't even want to be an operator. He said an operator's life was too full of vicissitudes to suit him.

Difficulties Attending the Introduction of the Telegraph in China.

A CORRESPONDENT of the *New York Herald*, writing from Foochow, China, under date of August 26, 1874, gives the following interesting account of the difficulties and observations encountered in the attempts made to introduce the electric telegraph in that country:

About the time of the embassy the Baron de Meritens, Commissioner of Customs at Foochow, endeavored to secure the erection of a telegraph from Pagoda anchorage to the foreign settlement, a distance of about eight miles. The work was commenced, but the poles erected in the daytime were summarily pulled down at night by the people, who declared that the telegraph would utterly and forever destroy the "fung-shui" of the neighborhood. (In this place "fung-shui" may be translated "good luck." There is no time for a philosophical dissertation on the subject just now.) The mandarins declared their inability to control the people in their prejudices, and it was very evident that if they did not actually encourage the rabble in tearing down the poles they at least had no word of rebuke for the action. Of course the project came to a premature end, and the "new era," so far as Foochow was concerned, was indefinitely postponed. Four or five years ago the foreign consuls at Shanghai made an effort to secure the erection of a telegraph from Woosung to Shanghai, about twelve miles. The intelligent Taotai replied to their application that the erection of a telegraph would undoubtedly destroy the "fung shui" of the entire region, and it could not by any means be allowed. The project slumbered until two years ago, when the foreigners, having obtained the concession of land for a road from Woosung to Shanghai, proceeded to erect a telegraph on their own ground, thus for once outwitting John Chinaman. The "fung-shui" has remained about as usual, and there is "nobody hurt." A cable having been laid from Woosung to Nagasaki, and one also to Hong Kong, Shanghai was put in telegraphic communication with the world. As, however, there was only a land line of twelve miles, and that on ground conceded to foreigners, not much was yet accomplished toward giving the "new era" a start.

But now it seems as though the Japanese are destined to do the world the favor of giving the "new era" a substantial lift. At the time the invasion commenced there was an application pending before the high provincial authorities here for the construction of a telegraph from Pagoda anchorage to Foochow. The application was made by the Foochow Chamber of Commerce in behalf of the Great Northern Telegraph Company, which is a Danish corporation. The chief advocate of the grant was M. M. Delano, Consul of the United States; and it is mainly due to his untiring energy and perseverance that it finally succeeded. Undoubtedly the Japanese trouble helped the promoters of the telegraph considerably. The arsenal is at the anchorage. It might be very desirable sometimes for the high officials at Foochow to communicate instantaneously with the arsenal and the gunboats. So Mr. Delano found the mandarins in a good frame of mind, and with the help of other consuls, soon secured permission to construct the telegraph along the banks of the river. The company went to work at once, and

up the poles on the north bank from the anchorage to the foot of Kooshan Mountain, laid a cable three-fourths of a mile long across the river and put up the poles on the south bank to within half a mile of the foreign settlement, when they met with a difficulty. They found it necessary to leave the bank of the river and to go across some rice fields and along a public road up the settlement. Of course they required new permission for this, which was accordingly sought. The mandarins feared it would excite a riot among the people and objected to granting the desired permission. This was an appropriate place for the British Consul to back out, which he virtually did, saying privately to the mandarins that it was not a British affair, and he didn't care to pursue it further. In spite of this disheartening circumstance, Mr. Delano persisted, and got a promise from the mandarins that the telegraph might take the route desired, provided the people were willing. He sent his linguist to talk to the people, secured their good will, and one day—in about twelve hours' time—the telegraph was completed, the much dreaded people actually helping to dig the holes and erect the poles. For several weeks now we have had telegraphic communication with the anchorage. The Taotai has inspected the operation of the telegraph and declared himself highly gratified with it. Six young Chinamen have been sent by the mandarins to learn the art of telegraphy. The "new era" is fairly launched, and "fung-shui" hasn't peeped a solitary objection.

Next comes Shen, the Imperial Commissioner to attend to Formosan affairs, all alive to the advantages of the telegraph, and makes a contract with the company to erect a telegraph from Ta-ka-o, at the southern end of Formosa, to a village at the northern end, thence to lay a cable to the mainland, and erect a land line up through Hingwer to Foochow. There is a little hitch just now, in regard to the terms; but it is not thought that any delay will be occasioned thereby.

Acting on the motto, "Strike while the iron is hot," the company made three distinct propositions to the mandarins for the construction of a line from Foochow to Amoy, there to be connected with the sea cable, and put Foochow in telegraphic communication with Europe and America. They wisely choose Mr. Delano to put it through for them—having had quite as much experience with the British Consul as they cared for. I am happy to say that he has again been completely successful. The high provincial authorities have accepted the second of the company's propositions, which was that they would erect the line at their own expense, and give the officials a separate wire for their own use, to be under their sole direction. A party has already started overland to survey the route; and as the mandarins are in earnest about it there is little doubt that the line will be completed in a few months, and "fung-shui" will be undisturbed.

Production of Electric Light.

THE London *Times* speaks of the new electric light apparatus, invented by Mr. Wilde, as a great success, enabling the type of that paper, on the beam of light being brought upon it, to be read at a distance of some two thousand yards.

From an extended description of this apparatus it appears that there is an electro-magnetic induction machine for producing the electricity, and an arrangement for regulating the light produced by the current, and projecting it upon distant objects, this electro-magnetic induction being founded upon a new and somewhat paradoxical principle discovered by the inventor—namely, that magnets and electric currents indefinitely weak can produce magnets and currents of indefinite strength.

Practically, the machine consists of a circular or cylindrical framing of cast iron, round the interior of which are arranged a number of electro-magnets at equal angular distances from each other. A cast iron disk is mounted on a driving shaft running in bearings fitted to each side of the framing, and carries a number of armatures revolving between the electro-magnets.

A slight charge of magnetism is imparted to the electro-magnets before the machine is used for the first time, by transmitting a momentary current through the wires surrounding the iron cores, or by touching their extremities with the poles of a permanent magnet. This initial charge is always retained by the electro-magnets, and is the basis of the augmentations of the electricity and magnetism produced by the rotations of the armatures. As the armatures revolve, they become slightly magnetized in their passages between the poles of the electro-magnets, generating weak currents in the insulated wires surrounding them, as must necessarily be the effect.

Now, these currents are transmitted by means of a commutator, through the wires surrounding the electro-magnets, so as to increase their magnetism until, by a series of actions and reactions of the armatures and electro-magnets on each other, the magnetism is exalted to the highest degree of intensity, and the

most powerful currents of electricity are produced—a small fraction of the current thus obtained being sufficient to sustain the power of the electro-magnets, while the major portion of the current operates to produce the light.

In the experiments made with this invention, to test its efficiency, a machine twenty-eight inches high, thirty-four inches in length, twenty-one inches in diameter, and weighing about eleven hundred pounds, was placed on board of a vessel, and the result of the test was, as stated above, that the light enabled a newspaper to be read at two thousand yards distance, and no boat could approach the light within a mile without being discovered.

Constants of Nature.

THE following circular has been issued by the Smithsonian Institution, asking the aid of chemists and physicists throughout the country in the preparation of a series of tables, the value of which, when completed, will be incalculable. No more important contribution to the sum of knowledge and to the advancement of science, both practical and theoretical, can well be imagined than the determination of some of these constants:

SMITHSONIAN INSTITUTION, }
WASHINGTON, D. C. }

The Smithsonian Institution has in view the publication of a series of tables of "Constants of Nature," such as the atomic weight of bodies, specific gravity, expansion, elasticity, specific and latent heat, conducting power, melting and boiling point, weight of different gases, liquids and solids, crystalline form, strength of different materials, index of refraction and dispersion, polarizing angle, velocity of sounds, of projectiles, of winds, of electricity, of light, of flight of birds, speed of animals, etc., etc.

The value of such a work in aiding original investigation, as well as in the application of science to the useful arts, can scarcely be overestimated. To carry out the idea fully, however, will require much labor and the united efforts of different institutions and individuals devoted to special lines of research.

The cooperation, therefore, of those who receive this circular is respectfully invited to the enterprise.

Since the different constants are to be carefully tabulated, even a single determination of any one constant for any one body may prove to be of great value by supplying some important omission in a series.

Every contributor will, of course, be credited with his determinations, when published.

JOSEPH HENRY,
Secretary Smithsonian Institution.

[From the *Journal of Chemistry*.]

The Origin of Weather Telegraphy.

THE nationality of "Old Probabilities" has been a matter of discussion, but there can be no reasonable doubt that he is a genuine Yankee. Some have tried to make him out a Frenchman, about twenty years of age. Leverrier, in 1854, called attention to the importance of systematic weather reports, and in 1855, Louis Napoleon authorized such an undertaking. The stations from which the reports were received were mostly in France, but in 1857 the net work was extended to foreign countries. In 1858 all the important cities of Europe were included, and on the 1st of January of that year began the publication of the *Bulletin Internationale*. Up to 1863 occasional weather warnings were issued by the French astronomer, but it was only in that year that the French system of daily probabilities of weather was inaugurated. In 1865 commenced the series of quarterly volumes of the *Atlas General des Mouvements de l'Atmosphere*. Since that time the progress of weather telegraphy in Europe has been very rapid.

But the proposal to use the telegraph for this purpose was made in this country at least eight years earlier than Leverrier made the suggestion in France. Professor Abbé, in *Silliman's Journal*, traces the first printed hint of the kind to Professor Redfield, who in 1846 wrote to that journal as follows: "In the Atlantic ports the approach of a gale may be made known by means of the electric telegraph, which probably will soon extend from Maine to the Mississippi." The next mention of the subject is found in the *Smithsonian Report* for 1847, in an article by Professor Loomis. "When the magnetic telegraph is extended from New York to New Orleans and St. Louis, it may be made subservient to the protection of our commerce, even in the present imperfect state of our knowledge of storms." But however frequently the suggestion may have been made, it is to Professor Henry and his assistants in the Smithsonian Institution that we must assign the credit of having first acted upon it; and the agitation of this subject in the United States probably stimulated the subsequent action of European meteorologists.

References to the subject may be found in the

Smithsonian Report for 1848, 1849, 1850, and 1851. In that for 1849, it is stated that "successful applications have been made to the Presidents of a number of telegraph lines to allow, at a certain period of the day, the use of their wires for the transmission of meteorological intelligence;" and in that for 1851 we are informed that, "since the date of the last report the system particularly intended to investigate the nature of American storms, immediately under the care of the institution, has been continued and improved." The system of weather reports thus inaugurated remained in regular operation till 1861, when the disturbed condition of the country rendered its continuance impossible. But even before peace had been proclaimed Professor Henry sought to revive the systematic daily weather reports; and in August, 1853, at the meeting of the North American Telegraph Association, a paper was presented by Professor Baird, on behalf of the Smithsonian Institution, requesting the privilege of the use of the telegraph lines, and more especially in order to enable Professor Henry "to resume and extend the *Weather Bulletin*, and to give warning of important atmospheric changes to our seaboard." The Telegraph Association, in response, offered the free use of their wires for the desired purpose, and the inauguration of the enterprise was fixed for 1865; but the fire in January of that year, which so seriously embarrassed the labors of the Smithsonian Institution, compelled a postponement of the work to a more favorable time.

Professor Abbé sums up the matter as follows:

"It will thus be seen that, without material aid from the government, but through the enlightened policy of the telegraph companies, and with the assistance of the munificent bequest of James Smithson 'for the increase and diffusion of knowledge,' the Smithsonian Institution first in the world organized a comprehensive system of telegraphic meteorology, and has thus given, first to Europe and Asia, and now to the United States, that most beneficent national application of modern science, the Storm Warnings."

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Telegraphs and Railroads in Oregon.—Resignation of Superintendent Plummer.—Superintendent Lamb to succeed him, etc., etc.

ALBANY, OREGON, Oct. 6th.

TO THE EDITOR OF THE TELEGRAPHER.

FOR some time past very little of interest to the telegraphic fraternity has been transpiring in Oregon and Washington Territories.

The boys on the new wires are able to draw their regular salaries, and some even complain of getting lazy over the light business this season; caused, as we presume, by the low price of grain, etc. The Oregon and California and Oregon Central boys, however, cannot complain, with propriety, of having nothing to do, as every train is running "chook fall" with grain to vessels in Portland, loading for Europe and other foreign shores. Mr. Charles D. Faling, the efficient superintendent of telegraph and train despatcher, still runs these two roads, with Mr. John J. Kenny as chief and Mr. Will. B. Rice as asst. chief operators on the former lines. A new office has been opened at Marion, on this line, with Mr. R. H. Rutherford as operator in charge. Several other changes in the telegraphic department have been made, which are recorded in the "Personal" column of THE TELEGRAPHER, which valuable paper, by the way, is taken by every officer and operator on the entire line, with the exception of two, and we have strong hopes of getting them as soon as they get coin enough—the lack of it being their excuse.

The Oregon Legislature is now in session at Salem, and its actions are watched by the different large corporations with considerable interest, as there are a good many "Grangers" in this session, and they swear they are going to regulate things considerably in the way of tariffs and rates. One thing which they have done will not be grumbled at by these same corporations, and that is the repeal of the "equalization of taxes" laws, the object of which was intended, as its title indicated, to equalize the taxes of the State, but in nearly every instance it equalized up instead of down; and in some cases, such as the O. & C. Railroad and the W. U. Telegraph, the rate was increased some four or five thousand dollars more than their regular assessment, of course, causing great dissatisfaction. In some instances the courts were resorted to, and every contested case was decided against the State, causing a good deal of merriment among the opponents of the law.

Two new railroad and telegraph enterprises have been incorporated within the last few days—the Ore-

gon Pacific Railroad Company, for the purpose of building a railroad and telegraph line from Portland, Oregon, up the Columbia river, through Washington, Idaho and Montana, to some point on the Central or Union Pacific Railroad. Among the incorporators are the names of J. S. Hallett and G. H. Thielson. Mr. Thielson was formerly General, and Mr. Hallett Asst. Superintendent of the Oregon and California Railroad, and Mr. Hallett is also well known all over the Pacific coast as a railroad contractor, having built the Oregon Central, Oregon and California, in Oregon, and the U. P. Railroad in Washington Territory; and whenever he takes hold of a thing *something has got to give*. The other enterprise is the Oregon Central Pacific Railroad and telegraph line, from some point at or near Winnemucca, Nevada, through the Humboldt and Goose Lake country, via Springfield, Oregon, down the west side of the Willamette via Portland, to some point on the Columbia river. Some of our most substantial citizens are the incorporators of this company, but are not experienced railroad men.

Speaking of railroad and telegraph business puts me in mind of the U. P. Railroad in Washington Territory, which company are now operating their road without a telegraph line of their own. Some two or three years ago the Western Union and this railroad company entered into an agreement to do a reciprocity business, whereby the railroad was to transport all men and material for the Western Union free, and the latter company was to build and equip two complete lines of telegraph, and furnish and keep one in order for the exclusive use of the railroad company. This arrangement worked all right until some two or three months ago, when they got into some kind of a squabble and the arrangement busted, and the Western Union Company gobbled both lines, leaving the railroad minus a telegraph wire. The Western Union boys charge the railroad company for every telegram, and the railroad boys, when they catch a telegraph man, "nip" him, you bet!

One of our boys here in Albany has been "feeling his oats" over being the means of saving the life of a poor melancholy individual, who entered his office and wrote a message to a party in Illinois, informing him that he was tired of life, and proposed transferring himself into a cold corpse. Now, Joe was not going to stand such conduct; so, after sending the message, he grabbed his tile and rushed frantically up the street and informed the police that the fellow was on a "laudanum lay out," and for them to watch him. So one or two M. Ps. were detailed, and pretty soon the would be suicide engaged a room at the Exchange Hotel and was discovered just after he had drank the poison, but a doctor soon had him pumped out dry as a bone, and he only got a good cussing for his pains from the worldly-minded, and when he found out the way our telegraph boy had acted in cheating him out of his job he was going to naturally murder him, but Joe felt pretty good over it till last Wednesday, when the same fellow was found dead in a bed in the Chemeketa Hotel in Salem, having made a *dead* thing of it that pop, and Joe says it's the last time he's going to exercise any solicitude upon such cases. If they want to kill themselves they can do it, and be hanged, too, if it does 'em any good.

We understand Dr. O. P. S. Plummer, Superintendent third district, Western Union Telegraph Company, has resigned, to take effect the 1st of November. "Doc" will be missed by many of the boys, but we are glad to hear that Superintendent F. H. Lamb is the "coming man" to succeed him. Col. Lamb has an enviable reputation already over in Washington Territory, where he was Superintendent a long time, and hope he will suit the boys as well as Superintendent Plummer has. Doc is going into the drug business in Albany, as we are informed. But—so long. WEBFOOT.

Western Union and Quadruple Transmission.

TO THE EDITOR OF THE TELEGRAPHER.

WILL you permit me, through the columns of THE TELEGRAPHER, to reply to a statement in regard to the "most erroneously" assumed advantages to accrue to the public by the use of an alleged new discovery referred to in the New York Tribune of the 9th instant—said new invention being called by the electricians of the Western Union Telegraph Company "The Quadruple Telegraph." By the use of which each wire now in daily use is not, and cannot, as stated, be made practically four; further, that by its use the traffic of the company cannot, as stated, be economically increased without the creation of any more wires. It being a well known fact, both here and in Europe, that specially large wires had to be erected for the "Stearns Duplex." This, taking the cost of construction or reconstruction into consideration, leaves practically the line working on the "old Morse status," at least until reconstruction is paid for.

Now, with regard to the so-called quadruple system said to be in use between New York and Boston; it is also a well known fact that it is being worked necessarily on a large line wire, for, by an apparently curious

"paradoxical law," the speed of duplex, as also the speed of quadruple transmission over even a large line wire, is "reduced with mathematical precision," and this reduction of speed progresses rapidly for quintuple transmission, and so onwards until finally speed will entirely cease altogether. This fact is also well known to telegraph scientists—in a succinct way it means that if we erect, say a number six line wire for quadruple transmission, there will be (when the state of the weather admits of its being worked) practically a gain of only one wire. But, on the other hand, if it be attempted to work quadruple transmission on an old Morse line wire the gain will be practically nil.

This "new discovery" by the way, for some twenty-five years known to all telegraph scientists, which fact must have inadvertently been overlooked by my scientific friend, Mr. George B. Prescott—being described in the works of that eminent electrician, General Sabine, and others in 1854-5-9. Nevertheless, to Mr. Prescott is due the credit of its first introduction in this country. Now, for the sake of argument, admitting the statement referred to to be correct, let us see what would be the gain to the company according to Mr. Prescott's book, p. 149. The average rate upon Morse lines does not exceed seventeen words per minute, and this is a fair average—add seventeen words more for quadruple transmission, leaving the same still subject to all of the old Morse difficulties, such as climatic changes, liability to interpretation by feel, taste, or by sound by any Morse operator, and may be so appropriated; and, in addition, the same is subject to the inevitable fourfold complication of the Morse apparatus when adapted to quadruple transmission, and over sixteen compensations in order to meet, among other difficulties, that of ever varying climatic changes constantly taking place throughout this vast extent of continent.

What the people of this country require is a reliable, cheap system of telegraphy, whereby they may feel sure at all times of obtaining telegrams during any state of the weather, and that is to be found in the one upon which the eyes of the whole scientific world is now centred—namely, the (my) American (electro-chemical) automatic telegraphic system of the first order, which is capable of transmitting and receiving five hundred words and upwards per minute; one automatic line wire above referred to being practically equal to twenty Morse line wires. Within the past four years my rapid American (electro-chemical) automatic telegraph has repeatedly been pressed into the service of the opposition company during such seasons of stormy weather when the electro-magnetic telegraph came to a stand still. I hope you will excuse my trespass on your space when I tell you that in the year 1846, on this very important question of telegraphy, I stood before a committee in the British Parliament cheek-by-jowl with Alexander Bain.

GEORGE LITTLE, *Cons. Elec. Aut. Tel. Co.*
PASSAIC CITY, NEW JERSEY, U. S. A., October 9, 1874.

In the Wilds of Jersey.—Paterson, N. J., Operators.

TO THE EDITOR OF THE TELEGRAPHER.

Now I have got a task before me, but I shall try to brave it through. It's hard to tell where to begin. I am afraid if I begin with one, another one will "squeal" because he was not first.

However, I'll take my chances and commence with the telegrapher highest in position, Mr. W. J. Holmes, Supt. Telegraph, Erie Railway and branches. Mr. Holmes is a short, good sized, pleasant looking gentleman. He is very kind to his deserving operators and is as all superintendents should be, very strict. He is a very able manager, and were it not for him the Erie wires would soon go down hill. His office is in New York, but his home is at Paterson—like a great many other Patersonians he finds it hard to stay away from such a beautiful business-like city as Paterson.

Next on our list comes Mr. Sampson, "N," he is chief operator of the Erie—he holds the same position Mr. Jos. Angell did before Mr. A. engaged as Superintendent of Telegraph to the Midland. Mr. A. we understand is now running a wire for the A. & P. Telg. Co. between Chicago and Omaha. But we must not drift out so or we shall get lost, so we will retrace our steps to Mr. Sampson, who, 'tis said, is the right man in the right place. He is pleasant, keen sighted, of medium height, muscular, and what he says he means most generally. He is a fine gentleman and the boys all like him, so I am told. Mr. Sampson lives in Paterson with his family, and I understand he has recently had a new *souander* in the shape of a little boy baby. We wish father, mother and child all manner of success, and hope many more will follow this one.

Next we have Mr. W. E. Tator, "W," who works the day truck at the Erie depot at present. To Mr. Tator I am obliged for some of my information. Mr. Tator is a gentleman in every respect, and a good man for this office; he works one week nights, the next week days, changing with his partner, Mr. G. W. Holbrook, "F. S," who is another of that large family of

telegraphers. He has a brother at Jersey City, train despatcher, office of the Midland, and another at West End station of the Midland Railway, and how many more brothers or sisters are in the ranks I know not, but they are all good operators.

Passing out into the ticket office between 2 P. M. and 10:45 P. M. we find our old friend Tunis Dougherty, "T." We don't know why he went into the ticket business unless it is because he made enough at telegraphing to retire from it.

Tune goes into the telegraph office once in a while and lets the fellows on the wires know he is alive.

For fear of occupying too much space at once we will close this by signing our usual "sig."

P'S AND Q'S.

The Use of Tobacco.

TO THE EDITOR OF THE TELEGRAPHER.

MANY suppose they have a right to use tobacco at any time and in any place, and such persons think they give up their rights when forced to stop. They take as infringement any move which curtails their actions in its use.

We will not discuss the moral side of the question. The science of physiology teaches that the use of tobacco is a positive injury. Let every man decide for himself as to whether he has a right to injure himself or to injure others through injury to himself, or to squander his means, which may result in injury to others. That is the moral side. The law does not as yet touch it, but is as applicable as to whiskey. I should think that little feet which go unclad in winter, and little stomachs which ache with hunger the year round, suffer no less because the deprivation arises from the use of tobacco.

There are three kinds of legal restraints against smoking and one against spitting (*i. e.* chewing). Boston has an ordinance prohibiting smoking in the streets. That is one kind of legal restraint. The law will stop smoking in any incorporated town if smoked on the ground of nuisance—which it is to many of those who do not smoke. Thus any man can be stopped smoking on Broadway, New York, by any policeman who is requested to stop him on the ground that it is offensive. That is another kind. Then we have the rules of private corporations, which are binding. Thus in a theatre one may not smoke, and you never hear any but a drunken man—an ass—insist that he has a right to smoke where it is forbidden.

Against chewing—we see notices hung up against spitting, which is the same thing, and can be enforced. It is only through and on account of the forbearance of non-users of tobacco that any one uses it off his own premises, and even there it must be given up if its use endangers his neighbor's property, or if he make it a nuisance and it is complained of as such.

If any man in charge of any office is not upheld in his right to stop entirely the use of tobacco in that office, then he is wronged, and, in addition to his wrong, all society is wronged; because in failing to sustain him his superiors do violence to the laws of etiquette, which is the only law *real* gentlemen and *real* ladies have anything to do with in their social and business intercourse. The very commonest etiquette demands that no one should indulge a habit in the presence of others which habit is known to be offensive to some folks, unless he have the unqualified permission of each; nor will politeness regard such permission as good for any other occasion, even among the same people. Really polite people are scarce.

F. A. STUMM.

Telegraphic Bull.

PHILADELPHIA, Oct. 13th.

TO THE EDITOR OF THE TELEGRAPHER.

ALTHOUGH many errors occur in messages through the carelessness of operators, I consider the following out of the usual order of that kind of business and exceptional. I will only give the body of the message. The following is the original copy as it was sent from a W. U. office, where, I dare not say. "Mailed your Ledger, examination Wednesday, look in special notices for particulars, Emma gets card Monday, come in time." When received at destination it read, "Mailed you Ledger examination Wednesday look in school not issued for particulars Emma get around Wednesday, come in time."

I think no more need be said on the above, it explains itself. D.

A Railroad Telegraph Superintendent Killed.

THE pioneer telegrapher, Ned McDill, Superintendent of Telegraph, fell beneath a train at Rosedale, Mo., yesterday morning, and was instantly killed. Over twenty years ago he was well known to the fraternity at Chicago and Cincinnati. His death will be regretted by hosts of friends among operators and railroaders throughout the West. He leaves a wife and four children. His parents reside at Zanesville, Ohio.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, OCTOBER 24, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

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(P. O. Box 5503.)

38 VESEY ST., New York.

EXTRA INDUCEMENTS TO OBTAIN SUBSCRIPTIONS FOR THE TELEGRAPHER.

It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST OF THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

THE TELEGRAPHER is the only generally recognized and established representative of the

TELEGRAPHIC FRATERNITY

in the United States and the Dominion of Canada, and, as such, has long enjoyed the confidence and approval of the great body of the telegraphers. Every effort has been and will be made to not only maintain but increase its

VALUE AND EFFICIENCY.

It is no ephemeral publication, but is a successful and firmly established journal, as is demonstrated by the fact that it has regularly appeared for

MORE THAN TEN YEARS,

having been enlarged from time to time, as its increasing patronage has warranted.

It is hoped that, recognizing the value and importance of the paper, the telegraphers generally will renew their efforts to immediately and largely

INCREASE ITS CIRCULATION.

To give everybody a chance to

PARTICIPATE IN THE PREMIUMS

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to the person forwarding the names and money a No. 1 TELEGRAPH SOUNDER, or NOAD'S STUDENT'S TEXT-BOOK and CLARK ON ELECTRICAL MEASUREMENT, or any other Electrical or Telegraphic works of equal value.

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J. N. ASHLEY,

Publisher.

P. O. Box, 5503.

Getting up a Newspaper under Difficulties.

GETTING up a newspaper, with acute inflammation of the eye, and under a positive interdict from your physician of reading or writing, is a somewhat difficult matter to accomplish satisfactorily, and this is just the position we are placed in this week. An injury to one of our eyes on Sunday last, resulted in disabling us from editorial duty, or any other business in fact, until Thursday, and in order to get out THE TELEGRAPHER this week at all, we have been obliged to use such matter as was most convenient and easily arranged.

The illness of Mr. F. L. POPE, upon whom we do occasionally, in an emergency like the present, temporarily impose our editorial duties, leaves us in an additionally embarrassing position at the present time. We have endeavored to bear our affliction as patiently as possible, and trust, as our damaged optic gives decided indications, under skilful treatment, of speedy recovery, that by the time it shall become necessary to construct another number of the paper we shall be in order for a vigorous resumption of editorial duties.

The American Electrical Society.

WE learn by telegraph that the adjourned meeting for the purpose of completing the organization of the proposed Electrical Association was held in the Palmer House, at Chicago, on Wednesday afternoon last. There were present at the meeting forty or fifty telegraphers, including a number of the leading telegraphers in this country and many other prominent men interested in the science.

The meeting was called to order by Mr. CHARLES H. HASKINS, General Superintendent of the Northwestern Telegraph Company, who briefly stated its objects, as set forth in the circular which was printed in THE TELEGRAPHER of last week, namely: an interchange of scientific knowledge, the advance of electrical and telegraphic science, and the organization of a central association, which shall include in its membership all persons who are in any way interested in the objects of such a society. The committee appointed for that purpose at the preliminary meeting held on the 14th of September reported the Constitution which they had prepared, and which was unanimously adopted. This provides that an annual meeting of the society shall be held on the third Wednesday of October, at a place to be designated by the Executive Committee; that it shall be known by the name of "The American Electrical Society," and that its headquarters shall be in the City of Chicago.

A permanent organization was effected by the election of the following officers: President, Gen. ANSON STAGER, of Chicago; Vice-Presidents, C. H. HASKINS, of Milwaukee; G. B. PRESCOTT, of New York; H. P. DWIGHT, of Toronto; WILLIAM ORTON, of New York; JAMES GAMBLE, of San Francisco; JOHN VAN HORNE, of Louisville; and E. D. L. SWEET, of New York. Corresponding Secretary, I. N. MILLER, of Chillicothe, Ohio; Recording Secretary, C. S. JONES, of Chicago; Executive Committee, WILLIAM HENRY SMITH, J. J. S. WILSON, GEORGE H. BLISS, F. H. TUBBS, and C. H. SUMMERS. Directors, F. L. POPE, A. S. BROWN, of New York; W. W. SMITH, of Indianapolis; J. A. SWIFT, of Washington; S. D. FIELD, of San Francisco; GEORGE T. WILLIAMS, of Cincinnati; D. FLANERY, of New Orleans; C. O. ROWE, of Pittsburg; R. C. CLOWRY, of St. Louis; E. P. WRIGHT, of Cleveland; D. H. BATES, of Philadelphia; J. J. S. DICKEY, of Omaha; V. HUCKER, of Buffalo; G. G. DAVIS, of Baltimore; and J. R. DOWELL, of Richmond, Va.

We shall be able to furnish a fuller account of the proceedings of this important meeting and its action, from which we anticipate ultimately excellent results, with the provisions of the Constitution adopted, in the next number of THE TELEGRAPHER.

Resignation and Appointment of Supt. Am. District Telegraph Co.

MR. GEORGE F. DURANT, who for the last two years has been Superintendent of the American District Telegraph Company in this city, has resigned that position, having been appointed General Manager of the American District Telegraph Company at St. Louis, Mo., and left for that city on Wednesday last to enter upon the discharge of his new duties. Mr. DURANT is well known as a most capable and excellent telegrapher, and has discharged the duties of his late position to the general acceptance of the company and the employes, who regret to lose him. He is thoroughly posted in the District Telegraph system, and our St. Louis friends are fortunate in having secured his services.

MR. HENRY W. POPE, who has been Assistant Superintendent of the American District Telegraph Company for the past two or three years, has been promoted to the vacancy caused by the resignation of Mr. DURANT. He has labored faithfully and energetically for the interest of the company, and well deserves his promotion, not only for his past services but for his thorough knowledge of the requirements of the position, and for the signal ability which he has exhibited in the position previously occupied. He is an accomplished telegrapher, and his promotion will no doubt prove equally fortunate and advantageous to the company and himself.

Resignation of a Popular Telegraph Superintendent.

AS WILL be seen from the communication of our esteemed and attentive correspondent, WEBFOOT, of Albany, Oregon, Dr. O. P. S. PLUMMER, who has for several years past been District Superintendent for the Western Union Telegraph lines in Oregon, has resigned his position to engage in other business. Dr. PLUMMER has been a very popular and efficient Superintendent, and his retirement from the telegraphic service will be greatly regretted by the employes of his district. He will have their best wishes for his success and abundant prosperity in the business in which he proposes to engage, and throughout his future life.

It is understood that Dr. PLUMMER will be succeeded as Superintendent by Mr. FRANK G. LAMB, who is well known and deservedly popular on the Pacific coast as a telegraph superintendent. The company and the employes are both to be congratulated on securing the services of so capable and efficient a telegraphic official to replace Dr. PLUMMER. Mr. LAMB has been from his boyhood connected with telegraphy, and is thoroughly conversant with the requirements of the service, and in his care the interests of the company and the employes will be safely and satisfactorily attended to.

The Western Union Report.

FOR the reason which is elsewhere stated, we have been unable to prepare our review of the report to the stockholders of the Western Union Telegraph Company, made by President ORTON at the annual meeting held on the 14th inst.

We hope to be able to do this next week. In the meantime, our readers will find it interesting and profitable to closely study and analyze this report for themselves; it is one of the most interesting and important telegraphic documents which is issued during the year, and, like all of Mr. ORTON'S official reports, is readable and suggestive.

Annual Meeting of the Telegraphers' Mutual Benefit Association.

THE Annual Meeting of the Telegraphers' Mutual Benefit Association will be held at 145 Broadway, New York, at 7½ P. M. Wednesday, November 11th. There should be a large delegation of intelligent men at that meeting. Let the best men come, and let there be plenty of them.

Personals.

Mr. W. W. SKINNER, one of the "old boys," who has been for a long time agent and operator at Roseburg, Oregon, O. & C. R. R., has been promoted to the position of agent at Salem, Oregon, same Co. Good for "Sag."

Mr. J. L. WILLIAMS has been transferred from Gervais, O. & C. R. R., to Roseburg, as agent and operator, vice Mr. SKINNER, promoted.

Mr. J. H. WOODRUM has been transferred from Oakland, O. & C. R. R., to Gervais, vice Mr. WILLIAMS transferred.

Mr. G. A. TAYLOR has resigned his position in the U. repeating office, Yreka, Cal., to accept the position made vacant by Mr. WOODRUM's transfer from Oakland, O. & C. R. R. These changes suit all the boys, and we are "glad of it."

Mr. J. M. FISH, who has been acting as agent at Salem, Oregon, O. & C. R. R., has returned to his "first love," the telegraph office there, and pounds brass as of yore.

Mr. R. H. RUTHERFORD is operator and agent at Marion, Oregon, O. & C. R. R., a new office, just opened.

Mr. W. T. BODLEY, for a long time operator at Machine Shops, office O. & C. R. R., has resigned that office to accept a position as General Superintendent's clerk, same Co., at Portland, Oregon.

Mr. J. D. BODLEY has accepted the position lately resigned by his brother, Mr. W. T. BODLEY, at Machine Shops O. & C. R. R.

Mr. P. P. BODLEY is operator and agent at Comstock's, Oregon, O. & C. R. R.

Mr. THOS. R. SHERIDAN, formerly manager W. U. Tel. office, Albany, Oregon, concluded the Oregon Legislature could not be run without him, so he now fills the position of enrolling clerk to the Senate branch of that august assembly at \$5 per day. "Nothing like being a democrat"—is there TOM?

Mr. F. M. HUNTINGTON, ticket agent and operator N. J. M. Railway, at 68 Broadway, Paterson, has been transferred to the general office, same company, at 96 Liberty street, New York, as operator.

Mr. W. E. HUNTINGTON has resigned his position as manager of the A. and P. Telegraph Company, at Jersey City, to accept a more profitable situation with the American District Telegraph Company in New York.

The Telegraph.

By Cable.

HEAVY GALE AND TELEGRAPHIC INTERRUPTION.

London, Oct. 21.—A heavy gale prevailed on the North of England coast last night. Telegraphic communication in that section was interfered with, and up to this hour (2 A. M.) the trouble on the wires continues.

ADDITIONAL PARTICULARS.

London, Oct. 21.—A heavy storm of wind and rain prevailed last night and to-day throughout the north of England and in Scotland. All the rivers in that section are much swollen, the railway and telegraph lines interrupted, trees were uprooted in all directions, and chimneys and walls prostrated. Many persons were injured in Edinburgh by flying debris.

Three houses at Stockton-on-Tees were demolished and one person was killed.

Election of Officers of the Western Union Telegraph Company.

At a meeting of the newly elected Board of Directors of the Western Union Telegraph Company, held at the executive office, Thursday, Oct. 15th, the following officers were elected for the ensuing year:

- President.—William Orton.
- Vice-Presidents.—A. B. Cornell, Augustus Schell, George H. Mumford, Norvin Green, Harrison Durkee.
- Executive Committee.—William Orton, James II. Banker, Alonzo B. Cornell, Harrison Durkee, Norvin Green, Joseph Harker, Edwin D. Morgan, Augustus Schell, W. K. Thorn, C. Vanderbilt, Frank Work.

The American District Telegraph Company.

At a meeting of the Board of Directors held last week the following officers were elected for the ensuing year:

- President, E. W. Andrews.
- Vice-Presidents, A. B. Cornell and J. N. Gamewell.

Treasurer, A. W. Greenleaf.
 Secretary and Assistant Treasurer, C. B. Hotchkiss.
 Superintendent, H. W. Pope.
 Assistant Superintendent, F. D. Farrington.
 Superintendent Messenger Bureau, J. S. Ashurst.
 The following appointments have been made by the Superintendent, Mr. H. W. Pope:
 Mr. E. M. Fox, Manager, First, Third and Sixth Districts.

Mr. Jno. D. Frenor Manager Stock Exchange, vice Mr. Keeler removed.

Mr. John Hassard, Captain of Patrol.
 Mr. John F. O'Brien, formerly Manager of the Tenth District, roundsman, vice Mr. McNeely removed.

The company have organized a Bureau of Repairs, at 791 Broadway, for the repair, etc., of messengers' clothing which is furnished by the company. The company have also added to the construction department a horse and wagon to facilitate the movement of men and material. The wagon is neatly painted and lettered, and is ornamented on each side with a large medallion of a messenger in full uniform.

The police force employed by the company appeared in uniform October 23d, and excited general attention.

The several district offices are now being supplied with ample wardrobes to accommodate from 500 to 600 messengers, after the completion of which none of the force will be allowed to wear any portion of the uniform when not on duty.

The New Sandy Hook Telegraph Line.

The new telegraph line to Sandy Hook is rapidly approaching completion. The wires have been nearly all poled for sixty miles of the seventy-four required. The telegraph crosses the North River near 80th street by an armored cable, made in Europe, and consisting of a new compound of zinc, copper and platinum. The line runs through New Jersey to Bergen Point, where it crosses the Kill von Kull to the Staten Island shore near Port Richmond. From this point a branch runs to Tompkinsville, but the main line continues on across the island through Richmond, both quarantine stations, Roseville and Tottenville, and crosses the hill again at the southern point of the island to New Jersey, and extends to Amboy, then to the Highlands, and thence to Sandy Hook.

The Great Western Telegraph Company.—Receiver Appointed.

ON Tuesday, the 13th inst., Mr. O. H. Horton was appointed Receiver of the Great Western Telegraph Company, and has taken possession of the lines and property of the company. It is understood that at the expiration of sixty days the entire property of the company will be sold, and its affairs closed up as speedily thereafter as possible.

The Direct United States Cable.

THE Faraday and Dacia having been coaled, and the rudder of the Faraday, which had been injured, having been repaired, at the last advices received the expedition was about to start from Queenstown to renew the attempt to recover the lost cable, and if successful, to endeavor to complete the laying of the cable to the coast of Newfoundland, where it was to be connected with the section already completed to Torbay, N. S., and Rye Beach, N. H. The lateness of the season renders the success of this attempt extremely problematical.

Foreign Telegraphic Notes.

THE Government of the Cape of Good Hope have entered into contract with Messrs. Warden & Co., of Westminster, London, for the construction and equipment of several lines of telegraph in that colony and the Orange Free States of South Africa, which will place the Diamond Fields, and other remote parts of the colony, in connection with Cape Town. The construction of these lines will be attended with great difficulty, as the country through which the lines pass is, for the most part, uninhabited and without vegetation, food or water. The country is without roads, and forage and water for the cattle will have to be carried great distances. For some of the lines, we understand, iron poles will have to be resorted to, wood being unprocureable in the neighborhood, and its carriage from the coast fully four pence per pound.

Owing to the improved receipts of the Indo-European Telegraph Company, limited, for the half year ended June 30th, coupled with the certain amount of relief which the board have obtained from the Indian Government, and a reduction of the transit rates acceded to by the Imperial Russian Government, the board are enabled to declare an interim dividend at the rate of five per cent. per annum, free of income tax. The board also state that there is an early prospect of re-

duction in the present heavy payments made for the rent of special wire to the British Post Office.

A cable is to be laid from Callao to Islay, a distance of some 200 miles (over which soundings have already been made), and from thence another to Valparaiso. Following these the same company propose to lay a third between Callao and Panama, the whole to be completed by May 1, 1875, so as to place Valparaiso and intermediate points in daily communication with the United States and Europe. The company's agent has obtained very liberal concessions from the Governments of the countries interested. The Dacia and International are now fitting for sea, one of them to leave England with a working supply of cable early in October.

Telegraph Instruments on Trains.

THE Detroit Free Press says:
 "Colonel Wheaton, Superintendent of the Kalamazoo Division of the Michigan Southern Railway, has provided the train men with a new telegraph instrument, by which connection can be made with the main line at any place and despatches sent. The box is not large, but it affords room for train orders, stationery, one hundred feet of wire, etc. If a train breaks down, all that is necessary is to make connections with the main wire and orders can be sent or received at once."

A Great Telegraphic Feat.

ONE of the greatest feats in telegraphy upon record was accomplished last evening. By courtesy of the officers of the several telegraph lines communication was secured between St. Louis and Trenton, via New Orleans, thus making a continuous line of over two thousand five hundred miles, over which Colonel Robert Stewart, who sat at an instrument in the Southern Hotel, St. Louis, conversed with Mr. Charles Curtis, his Secretary, who sat in the Western Union office in this city. The arrangement was previously made that the two operators should meet at the wire at eight o'clock. Precisely at the hour stated Mr. Curtis was on hand. After waiting a half hour he asked St. Louis the time, and was told 7:30. Difference of time had not occurred to Mr. C. After another half hour's waiting, Mr. Curtis heard the Colonel ask the St. Louis main office if connections were all made, but before the main offices, only a few blocks distant, could reply, Mr. Curtis, 2,500 miles away, broke in with "O. K., Colouel, how are you?" The gentlemen conversed for over an hour, during which Mr. Stewart said, "Give my regards to everybody; I'm having a splendid time." A greater length of land wire, with one exception, when San Francisco and Boston were connected to ascertain the mean difference in time has never been secured, and though the difference was so unusually great there was no perceptible space of time consumed in the passage of the subtle current. The messages were not relayed or repeated, but passed direct from one end of the circuit to the other.—Trenton Opinion.

Resignation and Promotions in the U. S. Patent Office.

GENERAL M. D. LEGGETT has resigned the office of Commissioner of Patents, and intends to resume practice as Patent Solicitor.

Mr. Leggett's administration of the patent office has been able and faithful, and during his occupation of the position he has instituted several valuable reforms and improvements. His resignation will take effect November 1st.

Mr. John W. Thatcher, of Virginia, now assistant commissioner, has been appointed by the President commissioner to succeed Mr. Leggett; Mr. Ellis Speed, now examiner-in-chief, assistant commissioner vice Thatcher, promoted to commissioner; and Mr. Marcus L. Hopkins, examiner-in-chief, vice Speed, promoted to assistant commissioner.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

OCT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
15	78% ... 79½	....	....
16	79 ... 80%	16 ... 16	40 bid ...
17	79½ ... 80%	16 ... 17	40 ... 42
19	79% ... 79½	....	40 ... 41
20	79½ ... 79%	....	39 ... 40
21	79% ... 79%	....	37½ ... 40

The British man-of-war Seagull has visited Cienfuegos for the purpose of testing the practicability of laying a cable thence to Jamaica.

New Patents.

For the week ended September 22, 1874, and bearing that date.

155,207.—DISTRICT ALARM TELEGRAPHS.—William D. Snow, Brooklyn, N. Y. Filed June 18, 1874.

Normally closed line, to which is connected branch house circuits, a resistance being placed in main line between terminals of branches. Circuit closed to a magnet releasing gravitating circuit breaking and making bar.

1. The combination of a normally closed main line, one or more normally open branch circuits, and a resistance or resistances, placed on the main line between the points of union of the branch circuit or circuits with the main line, substantially as described.

2. The automatic signalling apparatus, consisting of the gravitating bar H, released by the closing of the circuit, operating in its descent a fan or regulator, and acting, at the same time, as a circuit breaker, to transmit signals or messages of any predetermined character to any desired point, as described.

3. In combination with the gravitating signal bar H, the cut off apparatus M, consisting of the divided arc N, non-conducting strip P, lever Q, and springs R R, constructed and operating as set forth, for the purpose stated.

4. In combination with the normally open house circuit, the thermostat E and signalling apparatus F, constructed and operating as specified.

5. One or more resistance cells, placed, as described, in the normally closed circuit of a telegraph line, in combination with a normally open house circuit, including automatic signalling instruments, as described.

6. The combination of an automatic signalling instrument with a governing thermostat, operating through circuits governed by outside resistance coils, substantially as set forth.

7. The cellar V, placed on the telegraph pole in a position to catch the resistance or helix when the wire of the main line is broken, and complete the circuit through a ground line connected with the cellar by a wire running down the telegraph pole, as described.

155,208.—ELECTRICAL THERMOSTATIC ALARMS.—William D. Snow, Brooklyn, N. Y. Filed June 2, 1874.

Sliding plate with external indicator, showing position of wire inside of thermometer tube. Whole alarm on portable stand for use in any place.

1. The sliding plate D, in combination with the thermometer tube, the indicator R, and the wire H, said wire forming part of an electric circuit operating an alarm, all constructed and arranged as described and shown, for the purpose specified.

2. As a new article of manufacture, an adjustable electro-magnetic alarm thermometer, having a battery, circuit wires, and alarm mechanism, mounted on a portable stand, all constructed and operating substantially as described.

155,209.—EARTH BATTERIES FOR GENERATING ELECTRICITY.—William D. Snow, Brooklyn, N. Y. Filed June 6, 1874.

Obtains current, having intensity as well as quantity.

1. The improved earth battery, consisting of a series of elements buried in the earth and connected together to form a battery, substantially as and for the purposes set forth.

2. The combination of two or more electric currents or circuits, when one of these is a current derived from an earth battery, substantially as described, and is employed to operate the other or others.

155,237.—MAGNETO-ELECTRIC MACHINES.—William Hechhausen, New York, N. Y. Filed June 1, 1874.

The stationary magnets, parallel, or nearly so, to each other, and placed in a circular range with their poles alternating, in combination with the circular range of induction coil armatures revolved within the annular space between the poles, and with the adjustable disk and commutator connecting the induction coils with the binding screws, substantially as set forth.

155,259.—SPLICES FOR ELECTRIC TRACK CIRCUITS.—William Robinson, Brooklyn, N. Y. Filed July 18, 1873.

The combination, with the adjacent rails of a track and splice or fishbars, of the curved metallic plate A, applied between a splice or fishbar and the rails, and electrically connecting the rails, substantially as described, and is employed to operate the other or others.

155,261.—ELECTRIC CLOCKS.—Rudolf Sayer, New York, N. Y. Filed August 6, 1874.

Operated and controlled by electro-magnets, one magnet, by the movement of its armature, causing escapement lever to impinge against spring, closing circuit to other magnet and breaking its own.

In an electric clockwork, the combination of the escapement wheel B, and its anchor or anchors with the pivoted bar H, arm C, insulated springs J K, and one or more armatures, all arranged for operation, substantially as specified.

155,192.—ELECTRIC ANNUNCIATORS.—W. R. Cole, Detroit, Mich. Filed May 22, 1874.

1. The weighted disk D, pivoted in the frame A, in combination with the armature C, provided with the weight B and shoulder C, arranged and operating substantially as set forth.

2. The rock shaft E, provided with the arm F, and journaled in the frame A, in combination with the weighted number disk D, as and for the purpose set forth.

Born.

PARSONS.—At Batavia, N. Y., Friday, Sept. 25th, 1874, a son to W. H. PARSONS, manager Western Union Telegraph. The fourth nine-pounder.

GEO. H. BLISS & CO., TELEGRAPH MACHINERY AND SUPPLIES, HOTEL ANNUNCIATORS, Electrical and Electro-Medical Apparatus, 41 THIRD AVENUE, Chicago, Ill.

OFFICE OF EUGENE F. PHILLIPS, 20 CONDUIT STREET.

PROVIDENCE, R. I., September 15, 1874.

GENTLEMEN: I take pleasure in calling your attention to my

PATENT FINISHED INSULATED TELEGRAPH WIRE.

I claim this to be the best braided wire manufactured, and I believe it is universally acknowledged so throughout the country by all the large Telegraph Companies and Telegraph Supply dealers. Its points of superiority are:

- 1st. Its excellence of outside finish.
2d. The toughness of the Patent Compound with which the braid is saturated.
3d. By its polished outside finish, its adaptability for shedding rain and sleet.
4th. On account of the nature of the compound it can be laid directly against any wall or paper without staining or greasing it, which cannot be said of any other paraffine wire.

It is the only braided wire made, which, after it has been up for any lengthtime, will, with ordinary dusting, like any piece of polished furniture, look bright and fresh as when first put up. All other wire, regardless of its color, when first put up, will, in a short time, become dusty and dirt color, making an unsightly thing in an office, where mine, with its brilliant, fresh color, is an ornament.

The toughness of the compound, which also makes it capable of taking this splendid polish, makes it the most durable braided wire made. It is especially desirable for outdoor use, as the rain cannot beat the compound off, and its smooth surface prevents the snow and sleet from sticking to it.

A grease streak along the wall or paper behind the wire running into a nicely fitted up Broker's office, does not make him feel—well, good natured. This can be avoided by using this wire.

I also make it in cables of any number of conductors at the regular price for a single wire.

It is finished in any desirable color or plaids, with a light or heavy insulation, at the following prices:

Table with 2 columns: No. and Price, per lb. for BROWNE & SHARPE'S GAUGE. Lists prices for gauges 8 through 20.

Finer numbers at special prices.

Galvanized Iron Wire.....\$125 00 per mile. American Compound Wire..... 3/4 cents per foot.

Each covered with three heavy linen braids, and well saturated for outside use.

Ten per cent. discount in quantities not less than 10 lbs. Fifteen per cent. discount in quantities not less than 20 lbs.

A liberal discount for larger orders.

Patented November 18, 1873.

I also manufacture plain cotton or linen covered wire, or will saturate the braid of the same with paraffine, shellac or paint. This may be covered with a wind and braid outside, or two braids, or a single braid, as the customer may wish.

This, if applied, is rubbed smooth on the outside, and I claim and believe is as good as any braided wire made, outside of my Patent Finished.

Table with 2 columns: No. and Price, per lb. for BROWNE & SHARPE'S GAUGE. Lists prices for gauges 8 through 20.

Finer numbers at special prices. Discount same as on Patent Wires.

I also manufacture a RUBBER COVERED WIRE, which will not grow stiff and crack off in cold weather, or grow soft in the hottest weather.

By my process of putting this rubber on the wire will be found in the exact centre every time. After the rubber is put on it is vulcanized, and then covered on the outside with a braid

and finished, and is suitable for under ground, under water, or any outside or other purposes.

Table with 2 columns: No. and Price, per foot for BROWNE & SHARPE'S GAUGE. Lists prices for gauges 8 through 20.

Finer numbers at special prices. Discount same as on Patent Wires.

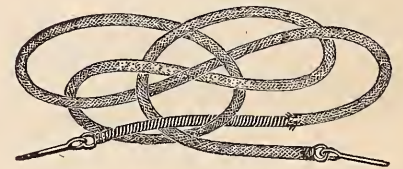
I have also just put in new and the most approved machinery for the purpose of making Magnet Wires, and feel satisfied that I can furnish as good as any to be had in the market at the following prices:

MAGNET WIRES,

BROWNE & SHARPE'S GAUGE, EITHER PLAIN, PAINTED OR PARAFFINED.

Table with 3 columns: No., Price, per lb., and COTTON COVERED, SILK COVERED. Lists prices for various wire types and gauges.

Finer numbers at special prices. Discount same as on Patent Wires.



I also manufacture a PATENT ELECTRIC CORD, which is pronounced by all to be the most flexible of any in the market, and the best suited of any made for Switch Boards, Medical Batteries, etc.

Silk covered, price per foot.....\$0 06 Cotton or Linen covered, price per foot..... 0 05

Ten per cent. discount on 100 feet. Fifteen per cent. discount on 200 feet.

GENERAL REMARKS.

All wire used by me is made to my special order, and is the best that can be had in the market.

As one of the largest dealers told me a short time ago, "Your wires have come into the market on their merits alone, and we have been forced to keep them," so you may feel sure I shall feel chary of that honor, and shall be very careful to furnish none but the very best in my power.

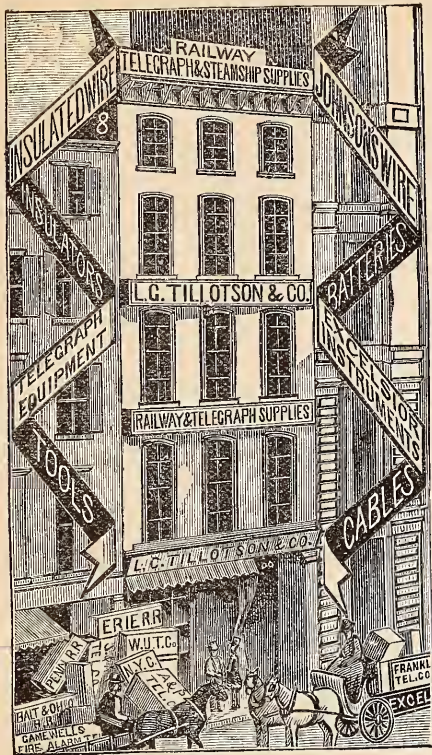
I could give a long list of testimonials, but I will still depend on the "merits" of the wire, and respectfully solicit your patronage.

Your obedient servant,

EUGENE F. PHILLIPS.

These Wires can be had at my prices of

- L. G. TILLOTSON & CO.....New York.
CHARLES T. CHESTER.....New York.
F. L. POPE & CO.....New York.
PATRICK, BUNNELL & CO.....New York.
PATRICK, BUNNELL & CO.....Philadelphia.
CHARLES WILLIAMS, Jr.....Boston.
THOMAS HALL.....Boston.
GEO. H. BLISS & CO.....Chicago.
H. D. ROGERS & CO.....Cincinnati.
GEO. C. MAYNARD.....Washington.
WATTS & CO.....Baltimore.



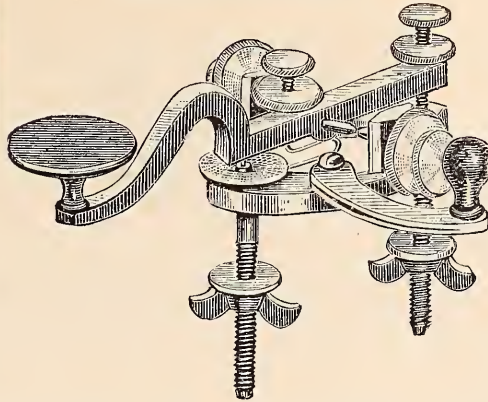
BUY THE BEST.
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 IF YOU WANT
EQUIPMENT.
 FOR A
TELEGRAPH LINE,
 ORDER OF
L. G. TILLOTSON & CO.
 They have the **GREATEST VARIETY.**
 They carry the **LARGEST STOCK.**
 Their **PRICES** are the **LOWEST**
 and **QUALITY THE BEST.**
 THEY GUARANTEE
EVERYTHING TO BE AS REPRESENTED.
 They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**
 EVERY ARTICLE REQUIRED FOR THE
CONSTRUCTION AND OPERATION OF LINES
 ALWAYS ON HAND.
 THEIR
EXCELSIOR
TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
 success of the times.
L. G. TILLOTSON & CO.,
 8 DEY STREET, NEW YORK.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all
 instruments of our manufacture.
L. G. TILLOTSON & CO.,
 8 Dey Street, N. Y. (P. O. Box 5602.)

WATTS & CO.,
 BALTIMORE, MD.



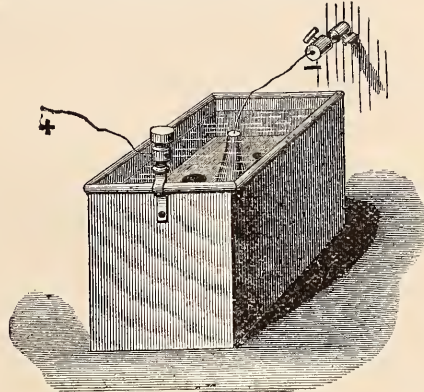
PATENT CIRCUIT-CLOSER KEY.

Does not keep line closed by binding against the anvil.
 Will not jar open.
 Slight pressure of the finger required to put lever in circuit
 or cut out.
 Acknowledged to be a decided improvement.
 Price, same as the ordinary key.
 Superintendents and Purchasing Agents are invited to examine
 our **EXTENSIVE FACILITIES** for supplying the

"BEST" GALVANIZED WIRE,
OAK OR LOCUST SCREW PINS AND BRACKETS,
CROSS ARMS,

BROOKS' OR CLASS INSULATORS,
SUPERIOR INSTRUMENTS AND BATTERIES,
 at the same prices offered by other establishments.
 Our new Illustrated Catalogue contains some useful informa-
 tion for Superintendents and others interested in the Science of
 Telegraphy.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense
and Labor at last Secured.

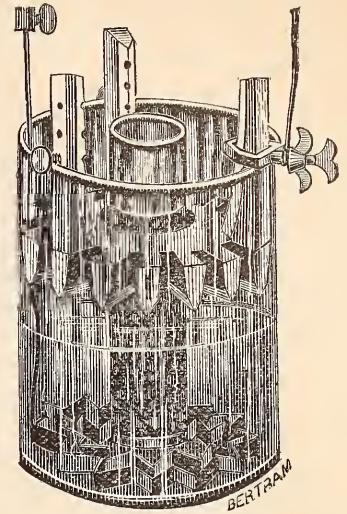
THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.
 The undersigned having secured the exclusive Agency for
 manufacture and sale of the
EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic
 and other purposes yet devised.
 The Battery cell is made of lead, and forms one pole of the
 battery. Sulphate of copper is the only chemical required to be
 used.
 These Batteries have been fully tested during the last year,
 although only recently offered for sale, and have proved to be
 superior to any other as regards efficiency, economy and dura-
 bility. When once set up they require no attention for from
 four to six months, according to the service required of them.
 Two sizes are made at present, but others will soon be ready.
 No. 1 is a large square cell, and can be used as a local or for
 running motors. Price, \$2.25.
 On Locals, one No. 1 cell is used in place of two Daniells, at a
 saving of nearly one half in cost.
 No. 2 is a round cell, designed for main line. Price, \$2.
 Descriptive circulars and price list forwarded upon applica-
 tion to

F. L. POPE & CO.,
 38 VESSEY STREET, N. Y.

THE BALTIMORE BATTERY.



Acknowledged to be **SUPERIOR** to any other for Telegraph
 purposes.
 Every comparative test made the past year resulted in the
 adoption of our Battery.

A prominent Superintendent writes: "My impression is the
 Baltimore is to be the Battery of the future." He has others in
 circuit, to determine the value of each in service.
 It is now in use on commercial and railroad lines, stock report-
 ing telegraphs, private lines. Superintendents fire alarm tele-
 graphs recommend it as the most reliable they have used.
 Thousands furnished Gold and Stock Telegraph Co. of New
 York, who use no other.
 For closed circuit it is without a rival.
 All kinds of Battery and Battery material for

WATTS & CO.,
47 HOLLIDAY ST., BALTIMORE.
 OUR ILLUSTRATED CATALOGUE NOW READY.

A AMERICAN COMPOUND TELEGRAPH
LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the **COMPOUND TELEGRAPH WIRE** compared
 with Iron, consists in its **LIGHTNESS** relative **TENSILE STRENGTH,**
CONDUCTIVITY DURABILITY, EFFICIENCY and **RELIABILITY.**
 Address, American Compound Telegraph Wire Co.

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COMPARISON OF RATES.

New York to	By Automatic,	New York to	By Wash Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
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Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

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SECOND HAND INSTRUMENTS.
 A large lot well polished and good working
RELAYS, REGISTERS
AND CUT-OUTS,

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 41 Third Avenue, Chicago, Ill.

AERICAN FIRE ALARM AND
POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,
General Agent for the West and North-West.

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THIS SYSTEM OF
FIRE ALARM & POLICE TELEGRAPH
WITH A CENTRAL OFFICE,
OR
UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

**SUPERIORITY, VALUE
AND
UNIFORM RELIABILITY.**

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Allegheny, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
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Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System
OF
**FIRE ALARM TELEGRAPH
IN THE WORLD.**

It is a sufficient vindication of the claims which are made by
the Proprietors of these systems of

**FIRE ALARM
AND
POLICE TELEGRAPHS,**

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE
PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

**EFFICIENCY,
RELIABILITY and
ECONOMY**

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THERE CAN BE NO QUESTION.**

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and

their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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AND MANUFACTURER OF

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AND EVERY DESCRIPTION OF

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These Instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine **ELECTROPOION BATTERY**, with Patent Platina Connection, introduced by us eight years since; also, **THE ALPHABETICAL OR DIAL TELEGRAPH**, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that will work practically with a single DANIELL cell, a **BATTERY** that does not require to be taken down but once a year, and the very best **MAIN LINE SOUNDERS** made

Our **CATALOGUE**, embracing a large amount of new matter and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
Resistance Coils, Submarine Cables,
AND EVERY VARIETY OF

ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
DAVID BROOKS, Proprietor,
22 South Twenty-first Street. PHILADELPHIA.

THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior
PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

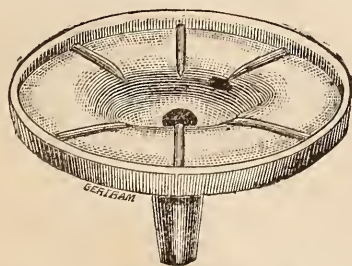
constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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PATENT BATTERY INSULATOR.



"As near perfect as we can reasonably expect in a contrivance for this purpose."

The best Battery Insulator in use.

Over 4,000 furnished the Western Union Telegraph Co. up to this time. The Montreal Telegraph Co. have adopted them, and have 2,500 now in use in their principal offices. They thoroughly insulate the Battery, and save more than their cost.

Price, 40 cents each. Liberal reduction for large quantities.

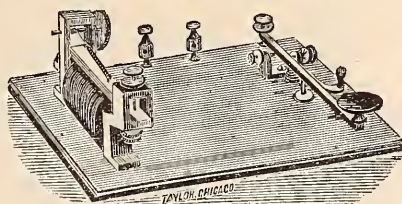
A very superior Screw Glass Insulator cheap. All kinds of telegraph and electrical supplies on hand.

WATTS & CO., Baltimore, Md.

Send for catalogue.

THE AMATEUR'S TELEGRAPH APPARATUS.

(Patented April 16th, 1872.)



ONE CUP BATTERY, CHEMICALS, WIRE AND MANUAL WITH EACH INSTRUMENT.

Complete outfit for the Student or for short line use. 5

Price, \$7.50.

Key and Sounder only..... \$6 50
" " with Lightning Arrester 8 00

Five per cent. discount for cash in advance.

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by Mr. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinhell, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

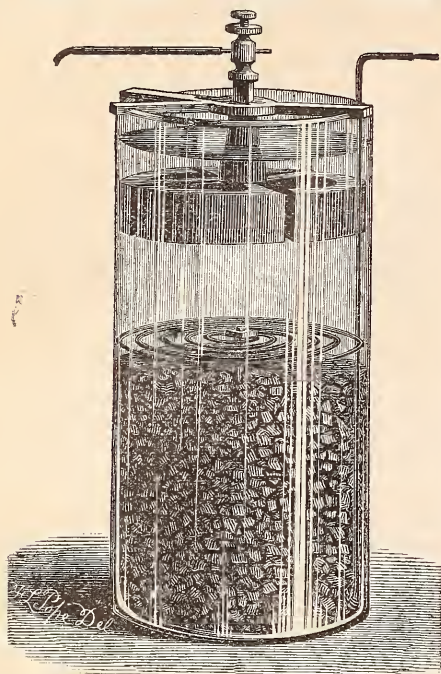
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given

The publishers will be announced hereafter

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LOCKWOOD BATTERY,
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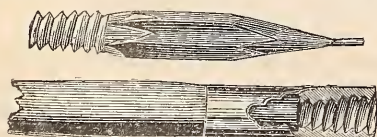
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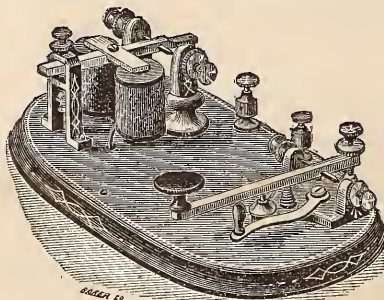
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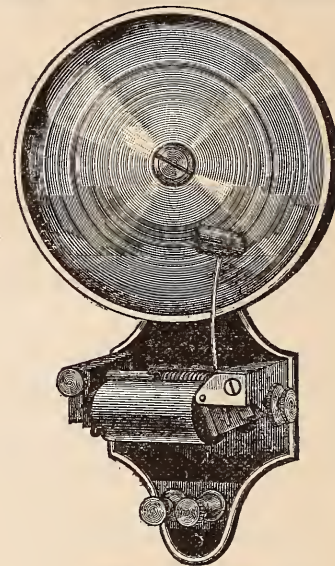


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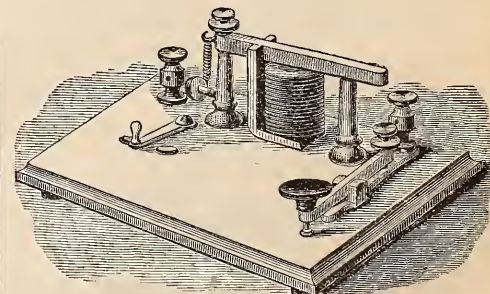
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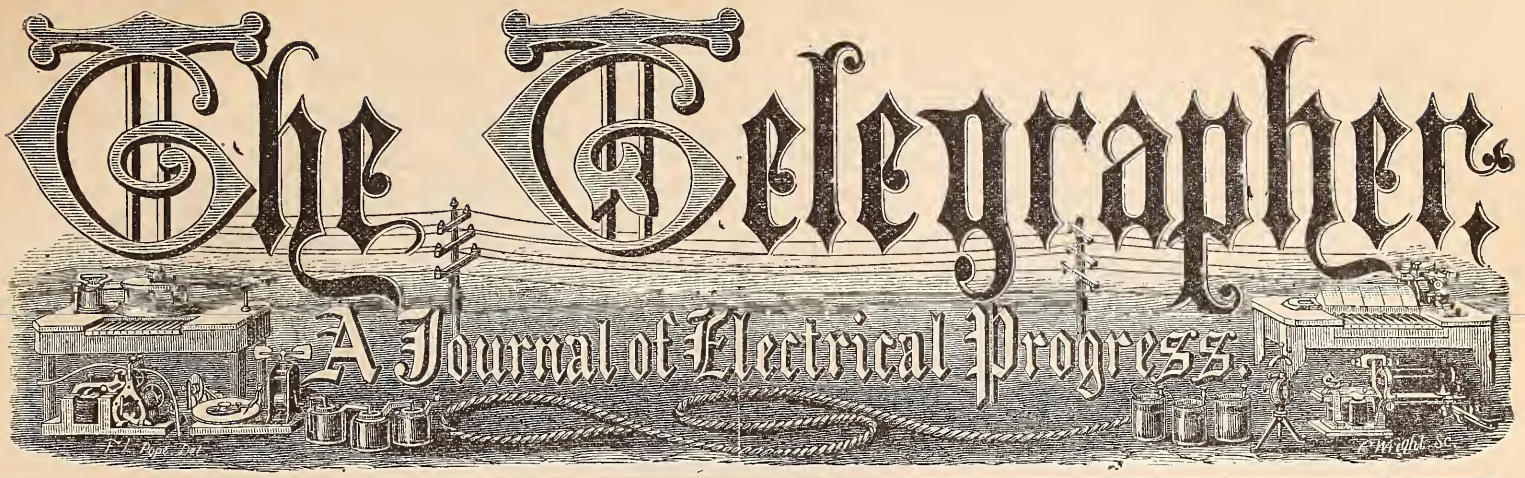
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, October 31, 1874.

Whole No. 433

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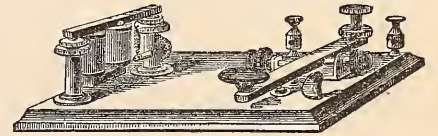
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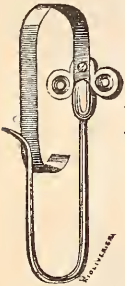
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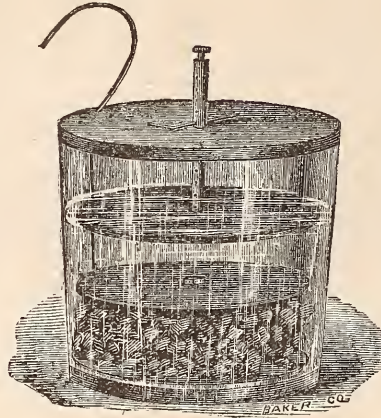
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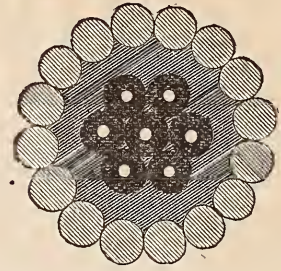
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Our WRECKING INSTRUMENT is still popular with managers of Railroad Telegraphs who find an attractive combination, giving loud sound without materially increasing the resistance beyond the standard of their relays.

We have rewound some of the old Box Sounders, in which we found the helices to have a resistance equal to 400 and 450 ohms. None of our Wreckers have over 175, while 150 is the standard.

Brass or nickel plated always on hand.

No local required. Always ready for temporary offices.

Just what is wanted for officers' cars.

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are declared better than all others for Office and Wrecking purposes, is because the devices for increasing the volume of sound are all patented, and cannot be found in ordinary Box Instruments.

We are offering 20 per cent. discount from list prices on all Instruments of our manufacture.

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THE TELEGRAPHER

A JOURNAL OF ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, OCTOBER 31, 1874.

VOL. X. WHOLE No. 433.

Western Union and Automatic Telegraphy.—Mr. Little in Reply to Mr. Orton.

To the Hon. WILLIAM ORTON, Western Union Telegraph Company.

Sir: Having in your annual report to the stockholders of the Western Union Telegraph Company made some remarks relative to fast telegraphy, permit me to reply to your statements, and I would here observe that in so doing I am actuated by the most kindly feelings.

You say, of "fast" telegraphy: "This is a favorite designation given by its friends to what is better known as the automatic system. Why it should be called 'fast' I have never been able to comprehend."

I will now proceed to explain to you why this system of telegraphy is "fast," and works equally well, if not better, during such storms as would seem to render other systems unreliable, and sometimes useless.

You say that "before a message can be sent at all

the statement of that eminent electrician, Sir Charles Wheatstone, in his paper published in the Philosophical Transactions, "On the Laws which regulate the Transmission of Electric Currents," that the speed of the English automatic system of telegraphy depends entirely upon the rate at which successive currents of electricity can be transmitted through a conductor, "without coalescing." He fixed this limit of speed on fifty miles of line to be for practical business equal to twelve hundred letters (not words), per minute. Mr. Culley, the engineer-in-chief of the British Postal Telegraph Department, says: That the automatic system, as it is at present employed by the post-office, in its telegraphic correspondence between London and the principal cities, works at a speed of from twenty to one hundred and twenty words per minute. But when the land line is increased to three hundred miles, with sixty miles of cable in the circuit, the speed will be only from forty to eighty words per minute.

I was, during the year 1869, following up in the United States my experimental investigations in relation to the then supposed insurmountable difficulty, as demonstrated by Wheatstone, and which resulted in the discovery and introduction by myself of many new salient features, whereby the automatic speed was increased on lines of two hundred and fifty miles in length from forty to sixty words per minute in clear weather, up to five hundred words and upwards per minute in very stormy weather on lines upwards of one thousand miles in length, when other systems failed to work at all.

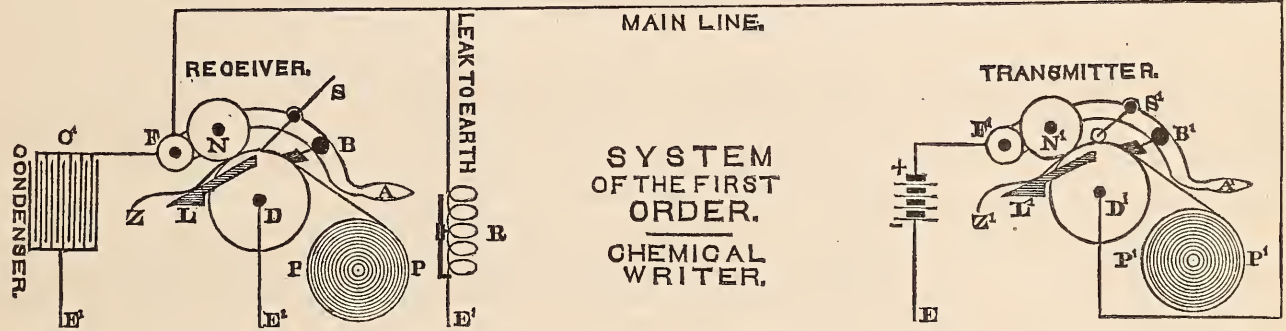
How I accomplished such large results permit me, with the aid of the accompanying plain "diagram," to render more clear to you. It being premised that, previous to my discovery, "Bain" and all other electricians directed the whole force of the line current on to the chemically prepared receiving paper, thereby al-

ferably my deliquescent "canary" or "yellow" colored preparation formula; S' is the transmitting rollers; L'L' the lifting blades, lying in a groove sunk in each of the drums and whose province it is to prevent overwinding and breaking of the paper. It should be observed that N S B are secured to one arm or lever A, so as to facilitate handling of the apparatus. is the battery, one pole of which is put to the earth E. R is an adjustable or a series of adjustable magnetic accumulator rheostats combined, or the accumulator or condenser may be used in a separate form as shown at C', also connected to earth, or in a shunt. E' E' E' E' shows earth connections. My shunted polarized relay or sounder used in connection with this system to give signals "go-ahead," "stop," etc., is not necessarily shown in the diagram.

In conclusion, you truly say, "the claim that anything essential to the operation of automatic telegraphy by the chemical paper plan of Bain, is covered by controlling patents, is without foundation." That being admitted, permit me to call your attention to the fact that by virtue of "controlling patents" in my possession (with the right of reissue), I claim the clearing of a main line of an electro-chemical automatic telegraph, by an overflow "rheostat dam" (single or compound), leakages, reversals, or by opposing currents, in order to produce rapid work in any state of the weather on any length of line, and signed by me in the following order (patents since issued)—August 6, 1870, August 26, 1870, August 4, 1871, December 12, 1871, June 20, 1872.

For preventing the attenuation of electro-chemical automatic telegraph writing by the use per se of condensers, helices, secondary batteries or opposing currents, signed by me (patents since issued)—Aug. 6, 1870, February 19, 1872, October 1, 1872, February 26, 1873.

LITTLE'S RAPID AUTOMATIC TELEGRAPH SYSTEM



more time must be spent in getting it ready for the transmission to begin than is required to send and deliver it in the ordinary way"—implying a loss of time, which more than offsets the advantages derived from rapid transmission. Permit me to suggest that this is a misapprehension of the facts and conditions of automatic telegraphy by the American system. On the contrary, as has been and is daily demonstrated in the practical operation of the system, the preparing the messages for transmission does not involve delay, and they can be prepared as rapidly as may be necessary for transmission; and there is none of the delay which is constantly experienced on Morse lines from the necessity of repetitions and errors arising from the imperfect condition of the wires. In the regular order of business while the line is occupied in the transmission of despatches, other messages are being prepared, and in a few moments the accumulation of an hour are transmitted and speedily prepared for delivery. In this connection the fact should not be ignored of the immense value which pertains to the electro-chemical automatic system, during such storms as sometimes prostrate all the line wires on a telegraph route; during such sudden stoppages of traffic, lasting sometimes for several hours, in the interval of repairs, Morse messages are being stacked up waiting for a line to be opened. And when a line is declared "O. K.," the accumulated Morse messages have to be sent in their regular order, and it sometimes happens that the last message is not got off the files until several hours have intervened. Now, in the case of the automatic system, the interval during the interruption of a line is occupied in perforating the accumulated messages in their regular order; and as soon as the line is signalled "O. K.," off goes every message in a few moments, possibly the accumulation of several preceding hours. This is of itself a valuable feature of the system, and your large experience in telegraphy will enable you to appreciate the importance not only to the telegraph interest, but also to the customers of such speedy delivery of unavoidably delayed business.

lowing the waves or pulsations of electricity to "coalesce," and to produce a continuous mark or line instead of clear and distinct marks or writing whenever it was attempted to produce over a very short circuit a greater speed than from forty to sixty words per minute. On the other hand, I was led by a train of reasoning to study, in connection with this problem, the operations of a "Mill-race," with its regulating sluices, which resulted in the introduction of the Overflow Magnetic or Accumulative Rheostat "Dam," and the Condenser, which allowed more or less of each electric wave to be changed or to escape to earth, permitting only just so much of each wave to pass on to the receiving paper to effect the writing, consequent upon keeping each succeeding electric wave from "coalescing" with its preceding wave, and so keeping each electro-chemical decomposing wave distinct, when transmitted at any rate of speed. In connection with this reply, I must not omit to mention the fact that the Bain chemical system had finally, in consequence of this "electric coalescence," to be operated by local circuits, thereby reducing the speed to the Morse average of seventeen words per minute (a very fair average), and was therefore subject to all the difficulties attending the ordinary Morse system—the receiving and counter current plan (of Snsini and Tainin, 1866) being for many reasons practically useless.

In the "American Automatic Electro-Chemical Writer," shown in the accompanying diagram, are flanged drums, which may be set in motion by any of the well known devices, but preferably by a small belt leading to a crank handle, to be worked by hand power—the labor required being very slight. PP is a roll of chemically prepared paper; P' P' a roll of paper having telegraphic symbols perforated or embossed on the same. The ends of the rolls of paper Z Z', is passed over the drums, and held in firm contact with their surfaces by the nipping rollers N N', and brushes or detainers B B', upon the arms or levers A A', which are secured or swung upon the fulcrums F F', and held down by a tumbler spring. The stylus S, is composed of a metal, the nature of which depends mainly upon the formula of the chemical solution employed, and through which the paper may have been passed (pre-

For preventing false signals by neutralizing extra currents set up when polarized relays or electro-magnets used as call apparatus, and connected to, or in the main line circuit of an electro-chemical automatic telegraph, by the use of "shunt helices," condensers, accumulators or secondary batteries, signed by me (patents since issued)—February 19, 1872, March 22, 1872, October 1, 1872, February 26, 1873.

For electro-chemical automatic telegraph vibrating or moving stylus, signed by me (patents since issued)—October 17, 1871, February 19, 1872, March 8, 1872, February 26, 1873.

For preventing the rupture or tearing of the paper, by the use of one or more lifting blades, or a cord or a wire line inserted in the groove of the drums or rollers, which carries the paper, signed by me (patents since issued)—December 22, 1871, February 19, 1872, February 26, 1873.

For "canary" or "yellow colored" deliquescent chemical, and other formula, signed by me (patents since issued)—two, May 24, 1872, one, August 31, 1872.

For securing the nipping rollers, stylus, and brush or detainer to one arm or lever, so as to facilitate handling of the "telegram"—signed by me (patents since issued)—May 22, 1872, July 20, 1872, February 26, 1873. Together with numerous patents for other "salient features"—including patents for simple perforators. I remain sir,

Yours most respectfully,
GEORGE LITTLE, Consulting Electrician,
Bloomfield Ave., Passaic City, New Jersey, U. S. A
October 15, 1874.

Original Articles.

The New Cincinnati, Ohio, Western Union Office.

By NIHL NAMELESS.

ON Saturday, October 24th, the Western Union Telegraph Company removed its main office in Cincinnati, Ohio, from the location which it had so long occupied, to the new building on the northwest corner

of West and Vine streets, lately occupied by Suire & Co. as a drug store, which has been fitted up expressly for its accommodation. The building is of five stories, and located as it is, in the centre of the business portion of the city, is well calculated to serve the interests of the company, and accommodate the principal customers. The company, as well as the public, has long felt the need of a more convenient and central location, and a more commodious and better adapted building for the accommodation of the large and increasing telegraph business in that city. This they have succeeded in securing.

Old associations and habits, too, frequently prove advantageous to a new business establishment, and it is generally conceded to be an indication of shrewdness on the part of a business man, who can successfully analyze the past history of a business and make the habits of the old customers turn honest pennies for him. As has been stated, the building just transferred to telegraphic use, was formerly occupied as a drug store. One may easily imagine that many a battery of "bottled lightning" has been unloaded into apparently innocent soda and mineral waters, and turned down aristocratic throats, in the past, at this store. Well, bottled lightning will still be found at the old stand, but the customers of the Western Union Company would not find it advisable to swallow it—it might possibly fuse their "helices." Many a paper of "Lightning Fly Killers" has been sold here, over which thousands of insect funeral processions have passed. Many a poor epicurean fly has revelled over the feasts so liberally provided, and found, too late, his temporary enjoyment turned to anguish and death. Lightning paper will still change hands by the thousands of sheets, but not to be used for the destruction of flies, though some of it, in the "Gold Room" may prove, pecuniarily, destructive to "bulls" and "bears."

The wires are conducted to the building down Vine street from Sixth street on the north, and up the same street from Pearl street on the south. Those coming down Vine street enter the building at the fourth story, at the fifth window, and those from the opposite direction at the fourth window from Fourth street, both on the same side of the building. From the windows at which they enter, the wires are carried along the ceiling of the rooms in the fourth story to the west side of the building, and through the floor to the switch board in the operating room. The wires pass through arches at the top of the windows, which have been pierced for the purpose, and insulated with Brooks insulators, and just inside the arches mentioned are placed the "lightning arresters." (The operators intend insisting on having them removed beyond the limits of the corporation, on the principle that if lightning is to be arrested at all the farther away it is the better. To wait until it gets inside the building and then undertake the arrest will be giving it an unnecessary advantage.) Through the city the wires are carried over a line of magnificent poles, straight, smooth and strong, solidly planted, and to make them more durable, and at the same time more sightly, they are painted white. Each pole has a carrying capacity of forty-three wires, making eighty-six entering the offices. The American Compound Wire is used, and being stretched taut, there is no unsightly and ungainly slack to swing and strike, interrupting currents of electricity and inducing currents of profanity among operators. The neat and substantial manner in which this part of the work has been done reflects great credit upon the Superintendent of Construction, Mr. M. C. Bristol. In the construction of these lines he has displayed excellent judgment, efficiency and taste, and well deserves the eulogiums bestowed upon him by your correspondent, "Yankee Abroad," in a recent number of THE TELEGRAPHER.

But to return to the building and its arrangement for the accommodation of the telegraph and its customers, which we are overlooking all this time. To commence at the lowest point will probably be the most advisable course, and the reader is, therefore, first taken to the basement. The basement has been fitted up with the necessary conveniences, and is divided off into supply and battery rooms and the room for the accommodation of the engine which works the elevator. It was at first intended to use the elevator for hoisting the operators to their room, which is in the fifth story, but, after mature deliberation, it has been decided to use the engine only for heating purposes during the winter, and for hoisting heavy articles, leaving the business of elevating the operators the sole and exclusive privilege of the Plug, our new telegraphic journal. It is to be hoped that it may not send them quite "as high as a kite."

The main battery consists of 1,400 cells of Callaud—the Grove battery having been discarded—and is connected to the switch in the operating room by improved insulated wires.

The first floor of the building is partly occupied by the passenger and freight departments of the I. C. and L., and C. H. and D. R. Railroads. The remainder of this story is used by the Receiving and Delivery departments of the Western Union Company. Much

taste and judgment has been displayed in the division of the room, and the arrangement and finish of the counters, and the accommodations furnished for the customers. The counters while making a neat and appropriate division of the space, produce quite an artistic effect.

Within the space assigned to the Receiving Department, the desks of the Superintendent, Mr. G. T. Williams, and of the Manager, Mr. F. A. Armstrong, will be located. The second and third floors of the building will not be used for the present for telegraphic purposes, but are to be rented for offices.

The fourth floor is divided into two rooms, besides furnishing closet and other accommodations. One of these is occupied by the bookkeepers and the other as a cloak, lunch and reception room. Visitors who call to see employes in the operating room will be received and seated here until the persons whom they desire to interview are at liberty to wait upon them. Should visitors happen in about lunch time they may, perhaps, be shocked at the disproportion between the demand of appetite and the supply of cold edibles.

We are now about as near heaven as we shall be likely to get at present, for we ascend to the fifth and highest story of the building, which is the exclusive domain of the operators, where, far above the turmoils and disturbances of the lower world, they may calmly and industriously perform their allotted term of service from day to day and night to night through winter's chills and summer's heats. It is understood that the determination not to use the elevator for their elevation was arrived at partly out of consideration for the pecuniary welfare of the operators, who will not be likely to descend and ascend many times a day to waste their time and pennies on things which are not necessary to existence. However that may be, situated thus above the earth, and isolated for so many hours a day from their fellow creatures who exist "lower down," they may handle the "forked lightnings" and think sulphurous thoughts to their heart's content, and none be affected thereby but themselves, or even aware of their existence.

The room occupied by the operating department is 104 feet long and 28 feet wide, exclusive of stairway and local battery room. In this (the local battery room) are located 106 cells of Callaud, which are connected with the switch and instruments by common office wires, which pass along the west side of the room to the switch and instruments on that side; thence through the switch across the centre of the floor, under a grooved and covered passage way to the instruments on the east side of the room. In their passage along the walls to the instruments they are let through slots into orifices in brackets, which again are covered by a neat paneling two and a half feet high, completely hiding them from view.

The switch used is of the style denominated "Jack Spring," and was on exhibition at the recent Cincinnati Industrial Exposition, and is of the same pattern as that used in the New York office of the company. It is placed in the middle of the room on the west side. Immediately opposite the switch on the east side is the desk of the chief operator. On the west side of the room are four tables, with accommodations for six instruments on each. On two of these will be used repeaters of the Hicks and the Grey and Barton patterns. On another of these tables the Louisville duplex and the Pittsburg wires are found. The others are at present unoccupied or occupied by single wires, and will be filled up as occasion may require hereafter.

On the east side of the room there are eight large tables, each of which will accommodate eight instruments. The further table, next to Fourth street, has four sets of duplex instruments, namely, Baltimore and Washington, New York, Chicago and St. Louis circuits. The rest of the tables are used for single wires.

The material of which the tables, switch board and chief's desk are made is Hungarian ash. They are handsome articles of furniture, and are each provided with two gas jets.

On the west wall, south of and near the switch, is situated the dummy elevator, which is connected with all the rooms used by the company, and communication between the different rooms is also furnished through the medium of Gilliland's Annunciators.

Forty-seven line wires enter the building besides three loops from the old Third street office, three from Adams' Express office, five from the Merchants' Exchange Hotel city wire and Depot city wire. The switch board is made to accommodate seventy-six wires.

Five registers for hot air from the furnace below are used, running up the centre of the room, and three ventilators have been opened in the ceiling. It will thus be the business of his Satanic majesty, the fireman below, to push heat up into the room from the basement in quantities sufficient to equal that which escapes at the roof, on the principle of a sausage machine, which disgorges at one end as fast as it is stuffed at the other. In case the ventilators should ventilate too much and discharge the warm air faster than it can be furnished below, it is proposed to "plug" them.

The ceiling is fifteen feet high, which will prevent any difficulty in regard to operators hurting their heads in moments of great exaltation of feeling, as over an increase of salary or reduction of labor, or *vice versa*—the *vice versa* being the most likely to happen.

The rooms lately silent with the ominous weight of potent drugs are now animated by the clicking of telegraph instruments. Where hnt a few months ago was furnished only poison for human stomachs is now distributed food for human brains. May the change benefit the world, and prove truly *pro bono publico*.

A New Yorker out West—with Notes by the Way.

BY GNUMMUC.

I LEFT the metropolis some weeks ago on the Hudson River day boat, and arrived in due time at Albany. Paid a visit to the new State capital building, called on friends in West Troy, and returning to Albany, dropped in to see Mr. Shelly and his able assistant, "jr." Early next morning I left for Saratoga, where my time was so occupied in sight seeing that I did not meet any of the fraternity. Next day found me at Niagara Falls, where I received kind attention from Mr. J. W. Murray, the International Hotel operator. Buffalo was my next objective point; here I met my old friend Tom Davidson ("Z"). I saw him last in Dayton, Ohio, several years ago, a frisky and festive youth. Now he is sobered down into steady going married life. I found the Buffalo boys very pleasant fellows, but very virtuous. Tares have no longer charms for them. At Dunkirk, next day, I met two very pleasant Erie Railway train despatchers, Messrs. Chase and Gross, who entertained me while waiting for connections. I was sorry not to have seen Mr. Connell as I passed through Salamanca. He rendered me several kind attentions that are appreciated highly. Here I took the palace car on the A. & G. W. R'y, and was soon soundly sleeping. I stepped into the railroad office at Mansfield, Ohio, next morning to send a message home, telling the operator who I was, but he refused my request in most ungentlemanly language—so afraid of being picked up, etc. I would not mention this were it not for the fact that it was the only incivility I received on my trip. That afternoon found me in the bosom of my family at Springfield, Ohio, a flourishing manufacturing city of about 16,000 inhabitants. Here are made the celebrated Champion Reapers and Mowers, Leffel's Turbine Water Wheels, Buckeye Grain Drills, besides many other agricultural implements. The Western Union office is presided over by the peculiar, philosophical and portentous Parsons, Jno. W. His assistants are his brother Charles and Frank Enoch. At the depot I found Jno. W. Hoak, the son of the veteran repairer. The A. & P. manager is the genial Martindall, the cigarist, formerly the P. & A. manager. The *Republic* is still flourishing like a Green Bay (Wis.) horse, as it were. I spent several days in Cincinnati, and of course was delighted with the magnificent Exposition. The telegraph department has already been noticed in your columns, so I will not dwell on it, but only say that the art gallery I have never seen equalled anywhere, and that the American Institute Fair in our city cannot compare to the Queen City's exhibition in any department. Cincinnati is to open its new office shortly in Snire's Building, corner of 4th and Vine streets. The receiving department is on the ground floor, very handsomely fitted up. The operating room is about 30 by 100 feet on the sixth floor, has a fine outlook over the city, and will have eight new octagon and four sextuple tables with plenty of room for more when needed. When I was there Mr. Charles Summers, the Chicago electrician, was fitting up the room, assisted by O. K. Newton and M. C. Bristol. The sisterhood have six or eight representatives who are at present working in a small room at the old office, but I understand that all will be together in the new. I observed many changes among the force since I left there nearly two years ago, but still quite a number of my old friends remain. I saw Bonnell, Selden, Mattoon, Armstrong, Johnson, Sr. and Jr., Gould, Madison, McCabe, Hamilton, the two Bakers, Wilson, besides many new faces. I had an offer of a pass to Indianapolis from T. O. Barbour, of the I. C. & L., but concluded to stay as long as I could in Clarke County with my relatives. In coming back I stepped off first at Delaware to see friends, then at Crestline, through compulsion in making or rather missing connection. It is a forlorn old town, and the office is in a miserable old shanty that is a disgrace to the railroad companies. Here I met the old vet. Hoyt, who is chief over some ten or twelve men. A fellow operator, by the name of McBradney, and I, paid a visit to the school, which we found in a flourishing condition. After spending a day at Massillon (I am indebted to Mr. Geo. S. Whitehead, of Pittsburg, for my P. F. W. & C. Railway pass), I went to Cleveland, having had time as the train stopped to chat with Delong, the P. F. W. & C. operator at Mansfield. The only operator I saw in the Forest City whom I knew was Powers, formerly of the

New York office. He is a recent arrival in Cleveland. Of course I saw the famous Euclid avenue, of which the city is justly proud; here may be seen miles of elegant residences with beautiful lawns and no fences to obstruct the view.

I took the sleeper that night for Elmira, where having an hour or so to spare I called on Davis, the night press man. Elmira W. U. office is certainly the neatest and prettiest office I came across on my journey. It is carpeted and has walnut and plate glass counters, etc. Indeed, the offices through New York State, as far as I saw, were much better than in Ohio. I spent that afternoon at Watkins, a beautiful village at the head of Seneca Lake, visiting the far famed Glen, and returned to New York on the night train, after an absence of four weeks, very pleasantly spent; but I received such a cordial welcome back from one and all, that I commenced duties refreshed in spirit.

Importance of Little Things in Telegraphy.

"TALL oaks from little acorns grow." We think it a duty, in a journalistic capacity, and a practically fraternal feeling, to keep impressing upon the minds of the boys the importance of carefully watching all the *simple and little things*. While it is a pleasure to applaud a good record and general work, it is also a friendly duty to remind one that he is not perfect, and that it is each one's part to modestly acknowledge that there is room for improvement. Without accuracy and speed the great telegraph would fail to be of special importance to the public. A very little mistake in sending or receiving, a few minutes late, or a little indifference to the desire of a patron, etc., etc., may, and often has produced an hundred fold disaster, financial and otherwise. The omission of an "e" or insertion of a "c" may put an op'r ill at "e's," and is something our employers or our patrons do not wish to "c." Of course we all know these things, but are we ever on the *qui vive* to avoid and correct them? "Accidents will happen," but we all feel that nine tenths of the errors made could have been avoided by using the care and attention which is expected, and for which we are employed. We are all apt to be somewhat conceited as to our capabilities, and thereby, in some unguarded moment, a "bull" sneaks in on us. We have the public welfare, to a great extent, in our hands, and we should exercise the same care in a message now as we did in our initial message.

The company expects us to be prompt, accurate and reliable, the public pay their ducats under that impression, and it behooves each and all to watch the little things for our own safety and that of others. This is an old subject, but is, nevertheless, an excellent one to harp on, and one which would gratify our employers greatly to see strict attention paid to.—*The Plug.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion. No notice will be taken of anonymous communications.

A Brief Summary of Events in Nebraska.

FALLS CITY, Oct. 22d.

TO THE EDITOR OF THE TELEGRAPHER.

I AM inclined to the belief, from the variety of contributions from this part of the west to THE TELEGRAPHER, that the craftsmen are derelict or else employed to their maximum capacity, and have not leisure to devote to an exchange of ideas and information through their acknowledged organ.

While such contributions continued to pour in I was content to passively read and digest the same in quiet meditation. I have the distinct recollection of hazarding a few comments and protests against the "Plug Mills," and called down upon my devoted head the fire of Nettie Bronson in a succession of sweeping broadsides; but as plugs are not my theme this time I have no fears of exposing myself to another *volley*.

Operators are a liberal, independent, self-contained class of thinkers, and their vivacious, spicy, acute contributions amply illustrate their wide range of thought, and depth of scrutiny, and vast resources of information. Scattered over the entire national domain, they can contribute a greater variety of observations and experiences than any other class. After all the correspondence through THE TELEGRAPHER about the practicability of forming an operators' union I am inclined to abandon the project for the present, on account of the existence of the above facts.

Many important changes have occurred in this region within the past month in line and road management, which I will briefly outline.

On the 1st inst. Mr. Fred H. Lawrence was succeeded as Superintendent of Telegraph and Train Master of the Atchison and Nebraska Railroad by Chill P.

Cochran, Esq. A general change in the management of the road prompted that change, as well as many others of equal importance. Mr. Lawrence leaves a great many warm personal friends among the operators of the west, and his departure is widely regretted. He was Superintendent of Telegraph of the L. L. and G. lines for about two years and a half. He is young in years but old in experience, and we wish him success in any future engagement.

Mr. Chill P. Cochran, who has filled the position of Train Despatcher for several years, is a wide awake, steady, enterprising craftsman, and can wear the ensign of authority without being spoiled, and fills his new position as meekly and humbly as an old stager.

I have not noticed any mention in THE TELEGRAPHER of the sad death of Mr. E. B. McDill, Superintendent of Telegraph of the M. R. F. S. and G. and L. L. and G. Railroad lines, which occurred about the 6th instant, briefly as follows: He got aboard a freight train at Kansas City to go down to Rosedale, his home, on the line of the M. R. F. S. and G. road, and on the arrival of the train opposite his house he started to go from a freight car over on to the engine, lost his balance, and fell on the track just behind the engine, and the whole train passed over him, mangling him in a frightful manner. He left a wife and four small children to mourn his sudden loss.

The operators held line meetings and passed appropriate resolutions of condolence.

Mr. McDill, during the war, was actively employed in constructing and managing the lines in Missouri and Kansas, in the Government service, and was one of the most expert operators in the west, and a skillful and experienced line manager.

The department of operating contains little that is new or startling out here. When business is light the artist fills his pipe and props himself back and seeks seclusion and ease, and calmly allows his eyes to peruse the telegraphic news in a daily published in an adjoining town with a secret purpose of detecting "bulls" in the copy furnished by some envied or hated colleague, and in doing so grimly allows some way office to call persistently and clamorously without a response. Local office grows impertinent and drops caustic insinuations about lazy operators, worthless or deaf, and said artist gives a few furious whiffs of his pipe and looks as though he would bite the stem off in his clenched teeth, and tears over the keys and makes a furious sputter of wrath-infused dots, and after a slur of impatient condensation signs and closes his key. And yet he is not happy! Operator at distant local office, with, perhaps, many other duties to attend to, condemns the unseen artist to oblivion, and, after a few hours, lays aside his wrath and smilingly opens his key and calls up said artist, and they are the warmest chums and long to embrace each other.

Line life is a secret *inside* life to the wondering outside world. It is astonishing what an insignificant number outside of the craft have the remotest idea how communication is transmitted through an electrical wire. The wild and simple questions of educated persons about this matter have furnished the overworked operators with a large part of their diversion. The ignorant are passed with more commiseration. The source is considered. With respects to the industrious craft, I bid adieu. AARON AROUND.

A Line Repairing Adventure in Oregon.

ALBANY, OREGON, Oct. 13th.

TO THE EDITOR OF THE TELEGRAPHER.

YEARS ago, just after the California State Telegraph Co. transferred their lines in Oregon to the Western Union, and before the latter Company made "Economy" their watchword, Webfoot was manager of the Albany office, on the immense salary of fifty per cent. commission on "local receipts," the Co. reserving unto themselves the "Eastern receipts," but of which, by the way, through a misunderstanding of instructions on my part, and oversight in the auditor's office, on the part of the Company, I for several months regularly appropriated half, and as the rates to Atlantic States were some three or four times as much as they are now it was "worth something," as one of the "old timers" here quaintly remarks. At this period of time the Company paid all bills without a dissent or any "cutting down," which has become so painful and frequent an occurrence in latter days. One day the line went down on my south "beat," and after getting a first class livery rig, and taking in a young fellow to do the "climbing of trees," if necessary, we started and made lively time for about six miles, when we found "it" in the shape of a big tree that some one had cut down over the line. On first discovering the place our helper shouted, "Here it is, Billy, just tie your horses—get out kit and tools and come over the fence." He cleared the fence with a single leap and lit right into the midst of the branches of the fallen tree. I stooped down to get the tools out from under the buggy seat and was just straightening up when the team commenced kicking and plunging and started up the road on

a keen jump, knocking me down in the bottom of the vehicle; and, as the road was over some freshly ploughed ground, it soon reduced me into such a state of bewilderment that I didn't know whether I was "one of these or one of those," and could not for some time regain my equilibrium sufficiently to get into the seat and gather up the lines which I found under the horses' heels, but soon managed to get the reins between my digits once more and "checked the team in their mad career"—that's the proper way to put it, ain't it?—and was shortly back to where I so unceremoniously left my friend Bob, on whom I contemplated getting off a pretty fair joke about leaving him; but he was not in a *joking mood*, for I found him laying, rolling and tumbling, all by turns, in the road, which was some five or six inches deep with dust, and, oh! he was swearing at a fearful rate, at the same time tenderly caressing different parts of his body, but principally the parts most commonly used in sitting, and on which he "lit" when he went into that tree. I suggested to him that "he need not be so demonstrative in his joy at seeing me, for I had no intention of leaving him." He mildly intimated that I could take my departure for a very warm place—which I thought was *not* very remote just then. He swore he would be even on "those yellow jacks" if it took all summer. We soon spliced in and hung a "stretch" or two around that tree. We were not afraid of the yellow jackets, oh, no! but we thought that they were there first and by priority of occupation *they had best right to that place*; and poor Bob, on the road home, was like the Dutchman's hen, "he sat standing," and for several days had no use for chairs.

Bear "Rises to Explain" Again.

TO THE EDITOR OF THE TELEGRAPHER.

"WHAT good will my testing do if I cannot explain the results?" asks the wordy and irrepressible Bear, who then "rises to explain" that "two like currents pass each other on same line in opposite directions!"—*Journal of the Telegraph.*

Unlike the *Journal*, I acknowledge my mistake. Should have said two unlike currents, or omitted the word "like;" but my reason for using the word was because *like poles* or plates of batteries are connected to line at ends. Although in this discussion I have used no more space than my worthy opponent I have not repeated a quarter column of *erroneous theory*, so I may be a little ahead in words. BEAR.

Miscellaneous.

STRAW LIGHTNING CONDUCTORS.—Straw is about the last material one would think of using for a "lightning rod," but according to a French journal it answers the purpose admirably. It had been observed that straw had the property of discharging Leyden jars without spark or explosion, and some one in the neighborhood of Tarbes got the idea of constructing lightning conductors, which were formed by fastening a wisp or rope of straw to a deal stick by means of brass wire, and capping the conductor with a copper point. It is asserted that the experiment has been tried on a large scale around Tarbes, eighteen communes having been provided with such straw conductors—only one being erected for every 60 arpents, or 750 acres, and that the whole neighborhood has thus been preserved from the effects not only of lightning but of hail also. *The Journal of the Society of Arts* says: "This statement comes from a respectable source, and the apparatus being extremely simple and inexpensive, it is at any rate worth a trial. Copper conductors are out of the question in ninety-nine cases out of a hundred, but every cottager almost could set up a straw one."

THE CORRELATION OF FORCES.—Of the various forms of energy existing in Nature, any one may be transformed into any other, the one form appearing as the other disappears. This is what is meant by "the correlation of forces." Thus the rotary power of a wheel, if applied to turn a magnet, is converted into electricity; and this electricity, if employed to drive a wheel, is changed back into rotary power.

PYROMETERS.—It appears from a report of a committee charged with examination of the above instruments, that, by means of the Siemens electric pyrometer, changes of resistance amounting to about $\frac{1}{10000}$ of the quantity of heat to be measured can be detected without much difficulty.

T. B. ALDRICH, in his pleasant sketch of Portsmouth, N. H., in *Harper's Monthly* for October, says that the lightning rod which protects the Warner House to-day was put up under the personal supervision of Benjamin Franklin in 1762, and is supposed to be the first rod put up in New Hampshire.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, OCTOBER 31, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

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President Orton's Annual Report to the Western Union Telegraph Company's Stockholders.

THE report made by President Orton to the stockholders of the Western Union Telegraph Company, at the annual meeting held on the 14th instant, which was printed in full in THE TELEGRAPHER of the 17th instant, gives a *resumé* of the operations of the company for the fiscal year ended June 30th last, which, under all the circumstances, may be regarded as financially favorable. It is true that it shows a reduction of \$70,364 53 in gross receipts, and of \$251,942 54 in net profits from the preceding years; but this is explained by the reduction of rates which took place at the beginning of the year, the panic of September, 1873, and subsequent business stagnation, from which there has not been a full recovery. The report did not meet the expectations of the speculators in the shares of the company, who anticipated a much more favorable exhibit, and the immediate effect on the market price of the stock was unfavorable. It seems to dispose of the anticipations which had been current for several months of a considerable scrip dividend in addition to the quarterly cash dividends paid. From the exhibit made it is evident that the ratio of earnings for the fiscal year would not have warranted dividends at the rate of eight per cent. on the outstanding stock of the company; but for the first three months of the current year an increase of net profits of \$300,000 is reported, which, if continued at the same ratio, will enable the company to continue the quarterly dividends regularly at that rate. In the concluding paragraph of the report Mr. ORTON states that the directors have determined hereafter to divide the net profits quarterly, and provide otherwise for the payment of such property as it may be deemed advisable to acquire. This may be done either by the issue of bonds, or by disposing, as it may become necessary, of the \$7,287,735 of the capital stock of the company owned by it, and now in its treasury.

In addition to its own stock owned by the company, acquired at a cost of \$4,054,483 07, the company holds nearly three quarters of the stock of the Pacific and Atlantic Telegraph Company, nearly a million of dollars of the stock of the International Ocean Telegraph Company, about half of the stock of the Gold and Stock Telegraph Company, and stock to a considerable amount (about \$1,350,000, cash value) in other companies whose lines are leased to the Western Union, the Western Electric Manufacturing Company, etc.

These investments of the Western Union Company

in the stocks of other enterprises do not appear as yet to be yielding any considerable revenue, although Mr. ORTON is hopeful that some of them may become sources of direct profit at an early day. The net revenues of the Gold and Stock Telegraph Company, and of the International Ocean Telegraph Company, have been considerable, but have been absorbed in defraying expenses which it is expected will soon be largely reduced.

It is claimed by some who profess to understand the matters of which they speak, that under more economical management, and with a simplified system of doing business, the percentage of profit both of the Western Union Company and of its subsidiary enterprises might be largely increased; that there is too much expensive red tape in the management, and that in the endeavor to secure absolute responsibility and accuracy on the part of its agents and employes, the cost of doing the business has been largely increased, altogether out of proportion to the results obtained. These point to the management of the Northwestern Telegraph Company, and of the Montreal Telegraph Company, as evidences of the correctness of their opinion. Neither of these companies cover territory anything like as good, telegraphically, as that of the Western Union Company, and the financial results of their management are declared to be much more satisfactory. If the stockholders of the Western Union Company are satisfied, however, it can hardly be considered necessary for others to criticise in this respect.

At the close of the fiscal year the company had in operation 71,585 miles of line, against 65,757, and 175,135 miles of wire, against 154,471, at the end of the previous year; and had 6,188 offices—an addition of 448 during the preceding year. There does not appear to have been any very considerable extension of lines during the year by construction—a large part of the increase having been from the acquisition of the Pacific and Atlantic lines by lease, on the first of January preceding.

The number of employes of the company is not stated, but as it was 9,190 at the close of the previous year, probably not far from 10,000 persons are now employed in the service of the company.

It is in the statements in regard to the duplex, quadruplex, and automatic telegraph systems that we presume a majority of the readers of THE TELEGRAPHER will be most interested. Of the duplex apparatus of Mr. J. B. STEARNS Mr. ORTON states that its extensive introduction and use has fully sustained the opinion of its utility and value expressed in his last annual report. We shall not take issue with him on this point, our own opinion on that subject being well known, even when Mr. ORTON officially expressed a decidedly adverse opinion to that which he now so confidently, and with good reason, maintains.

We have been somewhat surprised at the moderation of the views and endorsement of the so-called quadruplex telegraph given in the report, as we have anticipated a much more enthusiastic expression on that invention. With a carefulness and wisdom which is commendable, it is stated that, although negotiations for the purchase of the quadruplex patents are pending, "the terms will not be settled until after the character and extent of its capacity for work have been more fully ascertained."

In treating of automatic telegraphy, we regret to notice that Mr. ORTON seems not as yet to have made any material progress towards an appreciation of its merits and advantages. He does not attempt to argue the question, and only states one objection, and that a very old, and at first sight, plausible one, relative to the time occupied in preparing messages for transmission. We had proposed to discuss this matter at some length, but as Mr. GEORGE LITTLE, the inventor of the American Automatic System, treats of it in another department of this paper, we will not weary our readers with a repetition of that part of his open letter to Mr. ORTON. It will be seen that Mr. LITTLE, while admitting Mr. ORTON's assertions in regard to the chemical paper system of BAIN,

or the later one of Prof. WHEATSTONE, not being covered by controlling patents, argues that his American system now used by the Automatic Telegraph Company is a very different and the only really fast telegraph system, and is completely covered by his patents. We are not personally or pecuniarily interested in any automatic system or patents, but believing that automatic telegraphy can alone completely solve the problem of cheap and profitable telegraphy in the future, we had hoped that Mr. ORTON would have received some new light on the subject since the preparation of his previous official documents. It seems, however, that he is still unconvinced, and is not yet prepared to recant his previously expressed opinions, as he has done so handsomely in the case of the duplex, and which we are confident he will yet do in regard to the automatic. For this, however, it is evident that we must yet wait a while longer, which we will do as patiently as possible.

The Page Patent Litigation.

ALTHOUGH we have not recently referred to the Page patent, and the legal proceedings which are in progress to determine its validity, the defendants in the suits which have been commenced by the Western Union Telegraph Company have not been idle. A great amount of testimony has been accumulated, which will show the invalidity and absurdity of this patent as applied to telegraphy. Prof. PAGE's own evidence, given in the United States Court for the Eastern District of Pennsylvania, in 1850, proves that at that time he had no idea of claiming for himself the invention of the devices which are essential in telegraphic apparatus. Besides this the evidence already obtained is conclusive against the validity of the patent, as will be shown if the cases are ever brought to trial.

The proceedings are necessarily expensive, and all who are interested in defeating the monstrous claims set up under this patent should willingly aid in defeating the attempt which is being made to enforce it.

Tillotson & Co.'s Philadelphia Establishment.

AS WILL be noted by the card of Messrs. L. G. TILLOTSON & Co., in the present number of THE TELEGRAPHER, that enterprising firm have already carried into effect the purpose which was intimated two weeks since by us of opening a branch of their establishment for the sale of telegraphic and electrical goods in Philadelphia. As will be seen, they have secured a central and excellent location, where will be kept on hand a full stock of goods of their own manufacture, and other telegraphic and electrical apparatus and supplies which may be required. This new establishment will prove very convenient to their customers in Philadelphia and the section which looks to that city for its supplies, and we have no doubt will result in largely increasing their trade.

We have so often spoken of the excellence of the instruments manufactured and furnished by this firm that a repetition is scarcely needed at this time. Their goods are the best recommendation they could have, and all who may favor them with their patronage may rely upon honest and fair treatment from them.

Chester's New and Superior Registers and Relays.

CALLING in at the establishment of Mr. CHARLES T. CHESTER, at 104 Centre street, recently, we were shown a new style of telegraph register just manufactured by him, which he calls the European register, being modelled in some respects after the style adopted by the best European manufacturers, but which is much handsomer and greatly improved. All superfluous complications are avoided, is noiseless in its action, with pivot guards, and is enclosed within glass, and has a self-adjusting fan, which is a new and excellent device, and is run by a spring instead of a weight.

We were also shown a new style of relay manufactured, which is very handsome and well made.

We understand that Mr. CHESTER'S establishment is

very busy in manufacturing instruments, etc., to fill domestic and foreign orders.

Col. STEPHEN CHESTER, who has been in Europe for several months past on telegraph business, has returned and may be found at 104 Centre street.

The American Electrical Society.

We have received from our attentive correspondent at Chicago, "Occasional," a full report of the proceedings of the meeting at which the organization of the American Electrical Society was completed, with a copy of the constitution and by-laws adopted, but, on account of the lateness of their reception and their length, we are reluctantly compelled to postpone until next week their publication. The next number of THE TELEGRAPHER will contain them in full.

Personals.

Mr. J. J. BARTON, late of the Montreal Telegraph Company, at Sackville, N. B., has been appointed operator for the Grand Trunk Railway at Vandreuil, Quebec, Canada.

Mr. W. W. ALLEN has resigned the position of train despatcher on the M. and O. R. R. at Macon, Mississippi, to accept a similar position on the International R. R. of Texas. Mr. ALLEN has been on the M. and O. railroad for several years, and has made friends of all who knew him, and has the best wishes of his late associates for his future success.

Mr. D. B. MITCHELL has accepted a position with the Western Union Telegraph Company at New Orleans, La.

Mr. C. E. WILKINSON, of Chicago, Ill., Western Union day force, has resigned, to engage in other business.

Mr. CHAS. B. BURCH, operator in the Gold and Stock Telegraph Co.'s Chicago, Ill., office, has resigned, intending to devote his whole time to the livery business. What CHARLIE don't know about "horses" is hardly worth knowing.

Mr. FRED. McMILLAN, for the past six years "check boy" on the Chicago, Ill., Western Union day force, and recently appointed assistant operator of the Gold and Stock Telegraph Company, Chicago, has been promoted to the position made vacant by Mr. BURCH's resignation. This is a deserved compliment to a faithful and worthy young man.

Mr. JOHN KERNS, for the past two years "check boy" on the Western Union, Chicago, Ill., day force, but more recently operator at the Exposition building, has been promoted to the position made vacant by Mr. McMILLAN's promotion. This is another excellent appointment.

Mr. GEORGE SHAW, chief check clerk, Western Union, Chicago, Ill., office, nights, has been doing the telegraphing at the Exposition, in connection with his other duties, from the date of Mr. Kerns' promotion until its close.

Mr. CYRUS COBB, formerly chief operator Western Union, Chicago, Ill., day force, who has been engaged in other business for the past five years, has returned to his old love, and accepted a position on the day staff in the Chicago Western Union office.

Mr. FRED. LITGOW, for four or five years a "check boy" in the Western Union Chicago office, has a very nice position as operator and assistant ticket agent in the general ticket office, corner of Lake street and Michigan avenue. FRED. played the role of a detective very successfully, on a couple of confidence men a short time ago. The rascals victimized him, and made away with the contents of the drawer, but, through his ingenuity, were captured the same evening.

The Telegraph.

By Cable.

THE LA PLATE TELEGRAPH CABLE CUT.—LONDON, Oct. 28.—A Montevideo despatch says the Argentine insurgents have cut the La Plate telegraph cable.

Foreign Telegraphic Notes.

THE total number of messages forwarded from the postal telegraph stations in the United Kingdom during the week ended the 3d inst. was 403,520, and dur-

ing the corresponding week of 1873, 360,093; increase, 43,427.

The Brazilian submarine directors state that from the 23d of June to the 25th of September, notwithstanding interruptions on the lines south of Pernambuco, the total receipts amounted to £24,471, equal to a profit of nearly 6 per cent. per annum.

A quarterly dividend of 3s. per share upon both the preference and ordinary shares of the Globe Telegraph and Trust Company is announced, being at the rate of 6 per cent. per annum.

The total earnings for the half year of the Eastern Extension, Australasia and China Telegraph Company have amounted to £115,753, against £106,778 for the corresponding period of last year; the working expenses to £24,404; defalcations at Shanghai to £3,183; and the repair and maintenance of the cables to £3,099. Income tax and interest on debentures absorbed a further sum of £1,215, leaving a balance of profit for the half year of £83,852. One interim dividend of 1½ per cent., amounting to £29,962, has already been distributed, and another of similar amount is now declared, payable on the 15th October, leaving the sum of £23,927 to be carried forward to the next half year. The debenture debt has been reduced by £3,200, leaving a balance of £9,900, which will be paid off as the bonds become due. An interruption occurred on the China section of the company's cables, about forty-six miles from Hong Kong, in April last, and lasted about fifteen days, owing to the distance from the headquarters of the ship. On proceeding to repair it, it was found that the cable had been wilfully cut and about one and a half miles stolen. A reward was offered by the Government of Hong Kong, which resulted in the detection of the offenders, who have been convicted and sentenced to fourteen years' imprisonment, and their junk has been confiscated. The directors have acknowledged with thanks the great assistance afforded them by the Government of Hong Kong in this matter. The company's cables are at present in good order, and working satisfactorily, with the exception of that between Saigon and Hong Kong, which is now interrupted. The maintenance ship Agnes is, however, proceeding to its repair. The directors have much pleasure in recognizing the efficient manner in which the land line connecting their terminus at port Darwin with Adelaide has been maintained by the South Australian Government.

The Parliament of Western Australia was opened on July 1st. A sum of £15,000 has been voted for a telegraph line to Eucla, contingent upon South Australia commencing a line to the West Australian boundary.

The Direct United States Cable.

THE following communication from the Manager and Electrician of the Direct United States Cable Co., to the London Telegraph, will be found of interest as stating definitely the accident and its cause which interrupted the laying of the cable, and what has been done and is proposed to be done toward the completing the enterprise the present season.

To the Editor of the Daily Telegraph.

SIR—I am instructed by my Board to inform you that on the 10th of September the cable forming the Ireland-Newfoundland section of this company's line was, after 600 miles had been successfully laid from Ireland, broken in a heavy gale, owing to the Faraday having to haul back for a slight fault. Grappling was immediately commenced, but a succession of heavy gales, and the unfavorable state of the bottom, prevented the success of the operations, although the cable was brought to the surface on the second day after the accident, but slipped again on account of the exceedingly heavy sea prevailing at the time. The Faraday and her two tenders, the Ambassador and the Dacia, subsequently put into Queenstown, having run short of coal and supplies, and for the purpose of refitting parts of the picking-up gear, which was injured owing to the rocky nature of the bottom during the operation of grappling. The coaling and the refitting of the three ships is now being pushed forward with the utmost despatch, and they will forthwith leave Queenstown and proceed to the place of operations, when the contractors intend to abandon that short part of the cable which has been found to lie on rocky ground, and which extends over about thirty miles, and to effect the splice at a more suitable point, which has already been ascertained by soundings, and then to proceed to Newfoundland, avoiding the unfavorable bottom, and thus finish the work of laying our cables. My directors are of the opinion, after having consulted with the contractors, that, taking all circumstances into due consideration, the laying of the company's Ireland-Newfoundland cable will soon be completed. You will be pleased to learn that the sections of our cable which were actually laid—viz., the New Hampshire, Nova Scotia, and the Nova Scotia-Newfoundland sections, of an aggregate length of about 1,100 nautical miles—show by the daily tests a per-

fect insulation and a high transmitting power, and are ready for use so soon as the company's deep sea cable shall have been completed. I am sir, yours faithfully,

G. VON CHAUVIN, Manager and Electrician.
The Direct United States Cable Company (Limited),
Palmerston buildings, London, E. C., Oct. 9.

The Telegraph between Great Britain and Ireland.

TELEGRAPHIC communication with Ireland is maintained by means of four submarine cables, submerged between different points in Great Britain and the Irish coast. These cables contain in all twenty-two separate wires.

One of the largest cables—that between Holyhead and Dublin—has been laid since the post-office acquired the control of the telegraphs, and all of them have been under repair during the same period. The rocky nature of the bottom along the Anglesea coast has, it appears, seriously affected the condition of the Holyhead and Dublin line, the newest of all the Irish cables; in many places the outer iron wires which form the chief protection of the core have been completely chafed through from constant friction. Quite a new feature has also developed itself in connection with this fault, namely, the eating away, by a kind of worm, of the gutta percha covering of the core, in much the same way as wood is bored and eaten away by these destructive insects. The post-office can hardly be congratulated on the possession of these lines to Ireland, as they have been a constant source of trouble and expense ever since the transfer of the telegraphic system to the government.—London Times.

Why the Wires Wouldn't Work.

ONE day last week, while the operators in the Western Union Telegraph office at Central Wharf were busily engaged transmitting gold and stock quotations from that office to the different banks in the city, the instruments suddenly, and without warning or apparent cause, refused to work. Consternation seized all the operators, and they simultaneously gave up the explanation of this break of the lightning. The office was searched; no breaks or crossing of the wires could be found. The entire force there were nonplussed, dismayed, and at a loss to understand the wherefore. The gold and stock quotations had to be carried around to the banks, for the instruments sternly refused to utter a single click. The wires were followed all along their route through the city by the disheartened and now frantic telegraphers. On top of a tall house in the lower part of the city, across which two of the wires run, on Tuesday afternoon was discovered a hoop skirt suspended from both of them. A remark tinged with more force than elegance was heard, and the obnoxious article of feminine apparel which had restored the equilibrium between the positive and the negative wire was dragged down and thrown over into the street. Gold and silver quotations can now be transmitted as formerly. We have heard it said that there is always a piece of crinoline at the bottom of every trouble into which a man gets. So it seems.—Buffalo Courier.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

OCT.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.
22	79% 79%	.....	.....
23	79% 79%	16 16	.....
24	79% 80	.....	.....
26	79% 80½	15½ 15½	.....
27	79% 79%	16 16	.....
28	79% 79%	16 16	.....

New Patents.

For the week ended September 29, 1874, and bearing that date.

155,376.—MAGNETO-ELECTRIC MACHINES.—Otto Heikel, Jersey City, N. J. Filed November 13, 1873.

1. The revolving induction coil made of the four or more arms or wings a, and heads b, upon all of which arms or wings a continuous insulated wire is wound in the successive layers, substantially as and for the purpose set forth.

2. An adjustable magnet applied to and combined with the revolving induction coil armature, made in the manner before set forth.

155,392.—ELECTRIC ANNUNCIATORS.—George B. Scott, Brooklyn, N. Y., assignor to himself and William H. Markland, same place. Filed December 18, 1873.

Plug circuit closer in room. Number on shield carried by a static needle, consisting of three needles deflected by coil when circuit closed. Display and alarm continuous till room be visited and circuit there broken.

1. The combination, with an annunciator apparatus, of a plug or switch circuit closer, a sounding apparatus, a relay, and main and local circuits, substantially as set forth, whereby the sounding apparatus is arranged to operate until the circuit is broken at the room, as specified.
 2. A galvanometer coil and three needles, constructed and arranged substantially as specified, in combination with the signal of an annunciator, as set forth.

Born.

McLAUGHLIN.—To THOMAS F. McLAUGHLIN, night receiver of the Atlantic and Pacific and Franklin Telegraph Company, 198 Broadway, New York, office, a son.

PHILADELPHIA.

L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of

TELEGRAPHIC AND ELECTRICAL GOODS

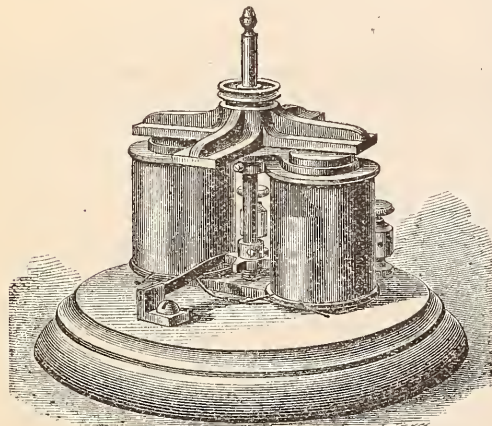
of every description, at

No. 54 SOUTH FOURTH STREET,
 (Corner Chestnut street.)

PHILADELPHIA.

They solicit the patronage of their friends and the telegraphic fraternity generally.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine

Run by Electricity!

It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery.....\$6 00
 " without Battery..... 4 00

May be seen working at the office of the THE TELEGRAPHER.

For sale by

F. L. POPE & CO.
 and

The Electro-Magnetic Manufacturing Company,

68 BROAD STREET, NEW YORK.

P. O. Box 1804.

WILLIAM BROWNLEE,

Dealer in

CEDAR TELEGRAPH POLES

OFFICE FOOT OF SHELBY STREET,

DETROIT, MICHIGAN.

GEO. H. BLISS & CO.,

TELEGRAPH MACHINERY AND SUPPLIES,

HOTEL ANNUNCIATORS,

Electrical and Electro-Medical Apparatus,

41 THIRD AVENUE, Chicago, Ill.

OFFICE OF EUGENE F. PHILLIPS,
 20 CONDUIT STREET.

PROVIDENCE, R. I.,

September 15, 1874. }

GENTLEMEN: I take pleasure in calling your attention to my

PATENT FINISHED INSULATED TELEGRAPH WIRE.

I claim this to be the best braided wire manufactured, and I believe it is universally acknowledged so throughout the country by all the large Telegraph Companies and Telegraph Supply dealers. Its points of superiority are:

- 1st. Its excellence of outside finish.
- 2d. The toughness of the Patent Compound with which the braid is saturated.
- 3d. By its polished outside finish, its adaptability for shedding rain and sleet.
- 4th. On account of the nature of the compound it can be laid directly against any wall or paper without staining or greasing it, which cannot be said of any other paraffine wire.

It is the only braided wire made, which, after it has been up for any lengthtime, will, with ordinary dusting, like any piece of polished furniture, look bright and fresh as when first put up. All other wire, regardless of its color, when first put up, will, in a short time, become dusty and dirt color, making an unsightly thing in an office, where mine, with its brilliant, fresh color, is an ornament.

The toughness of the compound, which also makes it capable of taking this splendid polish, makes it the most durable braided wire made. It is especially desirable for outdoor use, as the rain cannot beat the compound off, and its smooth surface prevents the snow and sleet from sticking to it.

A grease streak along the wall or paper behind the wire running into a nicely fitted up Broker's office, does not make him feel—well, good natured. This can be avoided by using this wire.

I also make it in cables of any number of conductors at the regular price for a single wire.

It is finished in any desirable color or plaids, with a light or heavy insulation, at the following prices:

BROWNE & SHARPE'S GAUGE.	
No. 8. Price, per lb.....	\$0 85
9. " ".....	85
10. " ".....	90
11. " ".....	90
12. " ".....	95
13. " ".....	95
14. " ".....	1 00
15. " ".....	1 00
16. " ".....	1 10
17. " ".....	1 10
18. " ".....	1 20
19. " ".....	1 30
20. " ".....	1 40

Finer numbers at special prices.

Galvanized Iron Wire.....\$125 00 per mile.
 American Compound Wire..... 3½ cents per foot.

Each covered with three heavy linen braids, and well saturated for outside use.

Ten per cent. discount in quantities not less than 10 lbs.

Fifteen per cent. discount in quantities not less than 20 lbs.

A liberal discount for larger orders.

Patented November 18, 1873.

I also manufacture plain cotton or linen covered wire, or will saturate the braid of the same with paraffine, shellac or paint. This may be covered with a wind and braid outside, or two braids, or a single braid, as the customer may wish.

This, if applied, is rubbed smooth on the outside, and I claim and believe is as good as any braided wire made, outside of my Patent Finished.

BROWNE & SHARPE'S GAUGE.	
No. 8. Price per lb.....	\$0 75
9. " ".....	0 75
10. " ".....	0 80
11. " ".....	0 80
12. " ".....	0 85
13. " ".....	0 85
14. " ".....	0 90
15. " ".....	0 90
16. " ".....	1 00
17. " ".....	1 00
18. " ".....	1 00
19. " ".....	1 10
20. " ".....	1 10

Finer numbers at special prices. Discount same as on Patent Wires.

I also manufacture a RUBBER COVERED WIRE, which will not grow stiff and crack off in cold weather, or grow soft in the hottest weather.

By my process of putting this rubber on the wire will be found in the exact centre every time. After the rubber is put on it is vulcanized, and then covered on the outside with a braid

and finished, and is suitable for under ground, under water, or any outside or other purposes.

BROWNE & SHARPE'S GAUGE.	
No. 8. Price, per foot.....	\$0 13
9. " ".....	0 12
10. " ".....	0 11
11. " ".....	0 10
12. " ".....	0 9
13. " ".....	0 8
14. " ".....	0 7
15. " ".....	0 6½
16. " ".....	0 6½
17. " ".....	0 6¼
18. " ".....	0 6
19. " ".....	0 5½
20. " ".....	0 5½

Finer numbers at special prices. Discount same as on Patent Wires.

I have also just put in new and the most approved machinery for the purpose of making Magnet Wires, and feel satisfied that I can furnish as good as any to be had in the market at the following prices:

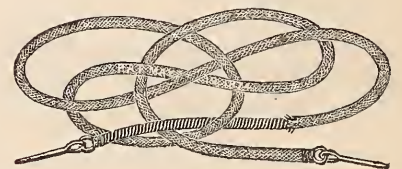
MAGNET WIRES,

BROWNE & SHARPE'S GAUGE,

EITHER PLAIN, PAINTED OR PARAFFINED.

COTTON COVERED.		SILK COVERED.	
No. 8. Price, per lb.....	\$0 60		
9. " ".....	0 60		
10. " ".....	0 65		
11. " ".....	0 65		
12. " ".....	0 70		
13. " ".....	0 70		
14. " ".....	0 75		
15. " ".....	0 75		
16. " ".....	0 75.....	\$1 80	
17. " ".....	0 80.....	2 00	
18. " ".....	0 80.....	2 10	
19. " ".....	0 80.....	2 20	
20. " ".....	0 85.....	2 30	
21. " ".....	0 90.....	2 40	
22. " ".....	1 00.....	2 50	
23. " ".....	1 10.....	2 60	
24. " ".....	1 20.....	2 70	
25. " ".....	1 30.....	2 90	
26. " ".....	1 40.....	3 00	
27. " ".....	1 50.....	3 20	
28. " ".....	1 65.....	3 40	
29. " ".....	1 90.....	3 55	
30. " ".....	2 00.....	3 70	
31. " ".....	2 10.....	3 90	
32. " ".....	2 20.....	4 05	

Finer numbers at special prices. Discount same as on Patent Wires.



I also manufacture a **PATENT ELECTRIC CORD**, which is pronounced by all to be the most flexible of any in the market, and the best suited of any made for Switch Boards, Medical Batteries, etc.

Silk covered, price per foot.....\$0 06
 Cotton or Linen covered, price per foot..... 0 05

Ten per cent. discount on 100 feet. Fifteen per cent. discount on 200 feet.

GENERAL REMARKS,

All wire used by me is made to my special order, and is the best that can be had in the market.

As one of the largest dealers told me a short time ago, "Your wires have come into the market on their merits alone, and we have been forced to keep them," so you may feel sure I shall feel chary of that honor, and shall be very careful to furnish none but the very best in my power.

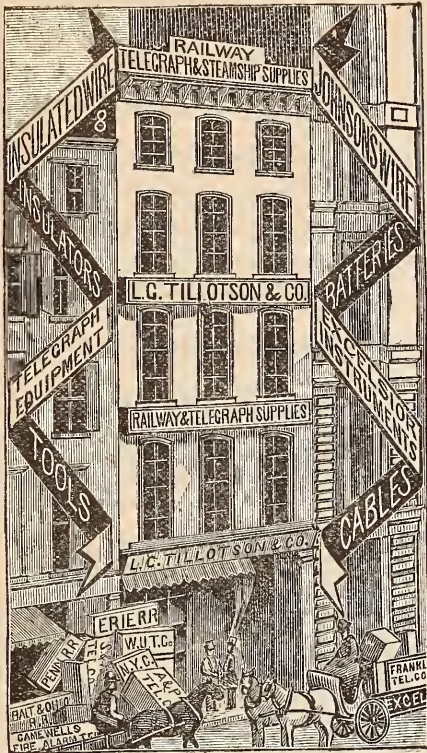
I could give a long list of testimonials, but I will still depend on the "merits" of the wire, and respectfully solicit your patronage.

Your obedient servant,

EUGENE F. PHILLIPS.

These Wires can be had at my prices of

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- CHARLES T. CHESTER.....New York.
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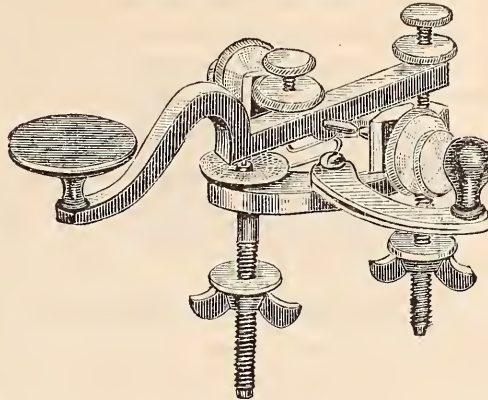
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Does not keep line closed by binding against the anvil.
Will not jar open.
Slight pressure of the finger required to put lever in circuit or cut out.
Acknowledged to be a decided improvement.
Price, same as the ordinary key.
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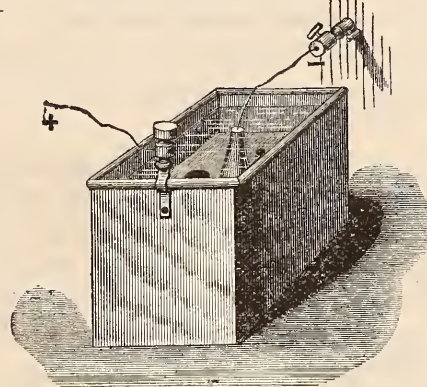
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PATENT APPLIED FOR.

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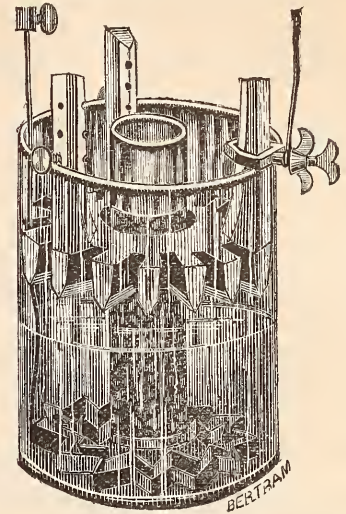
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Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

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Fall River, Mass.,
Fitchburg, Mass.,
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Only **PERFECT, COMPLETE and RELIABLE** System

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FIRE ALARM TELEGRAPH

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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

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The American System of

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has met with the universal approbation and commendation of the

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AND THE

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NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,
RELIABILITY and
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ABSOLUTELY PERFECT!

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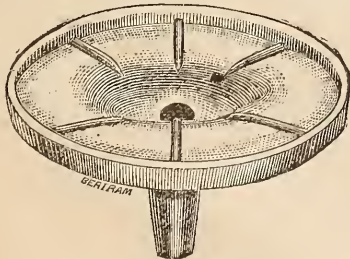
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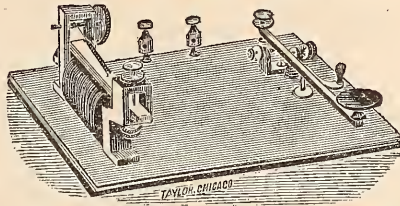
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A REVISE AND ENLARGEMENT OF THE
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BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawkshee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinhell, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

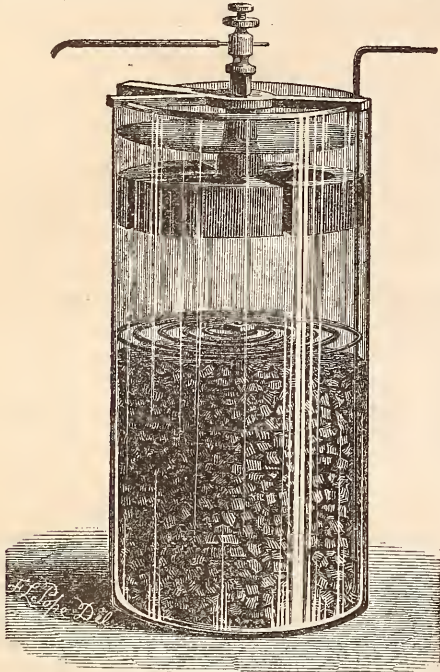
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter.

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
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PATENTED APRIL 8, 1873,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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AT THE
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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without **ANY ATTENTION** whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,

and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,

or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market. *Send for Circular.*

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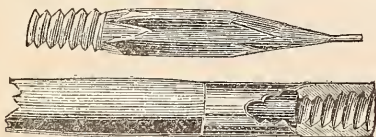
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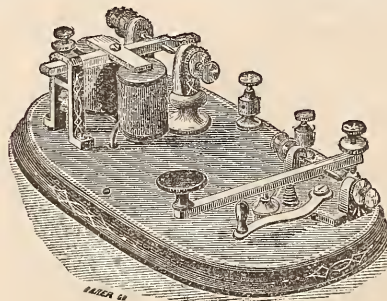
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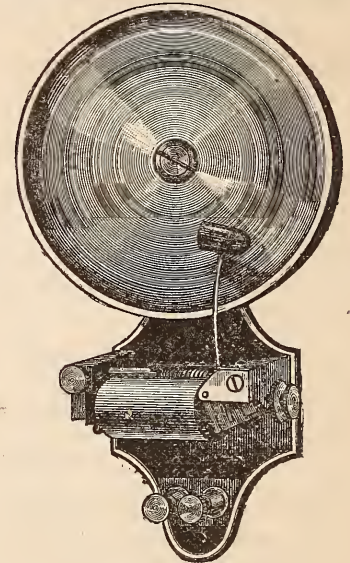


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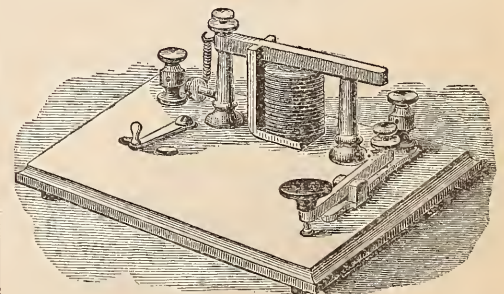
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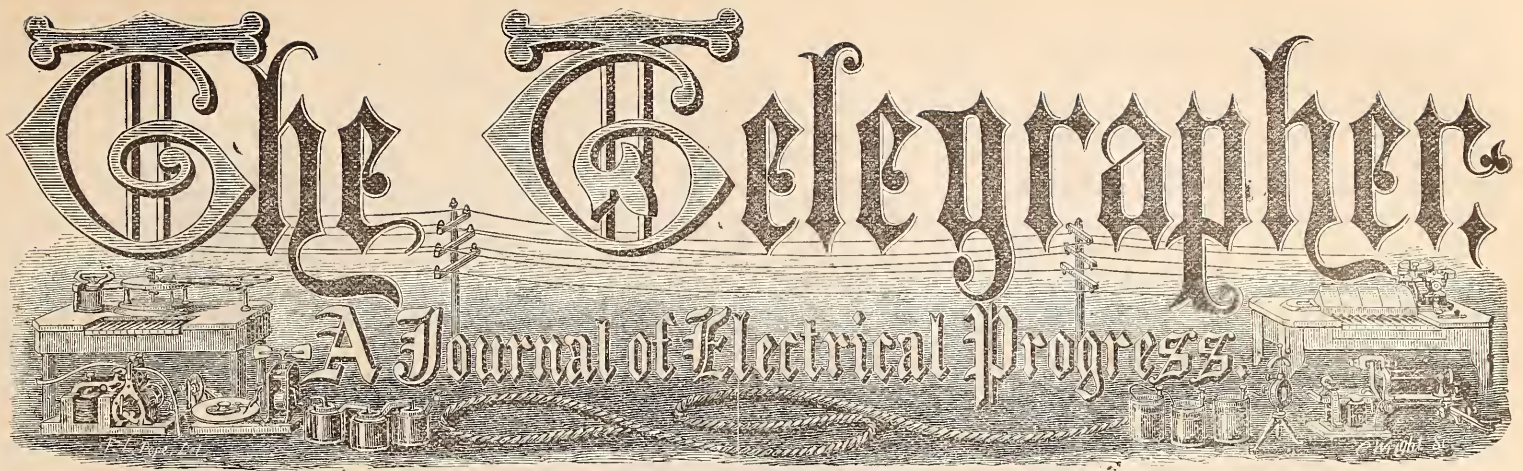
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The Telegrapher

A Journal of Electrical Progress



Vol. X.

New York, Saturday, November 7, 1874.

Whole No. 434

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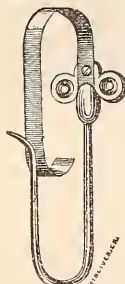
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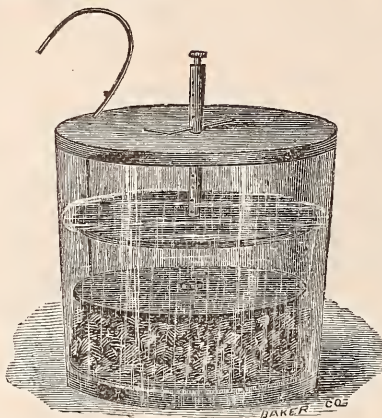
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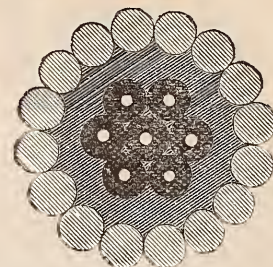
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, NOVEMBER 7, 1874.

VOL. X. WHOLE No. 434.

[Written for THE TELEGRAPHER.]

Joe Sanders.

BY I. C. EDWARDS.

THEY talk about their heroes,
Like "Jim Bladsoe," true and brave,
Who "held her nozzle agin the shore"
Till he sunk in the foam'n' wave,
And lots of other fellers
Who died while at their post,
But of all they write and sing about
Its engineers the most.

But I knew a *lightnin' jerker*—
(Now, you need not laugh at me)—
I'll tell you how *Joe Sanders died*
With his fingers on the key:
"A" was the end of the railroad,
With a junction just below,
And all the "runnin' orders"
Was shouldered on to Joe.

He was always prompt and easy,
And I've often heard him say
"There'd never be a smash-up
Cause things was slack at "A."
One fearful night in winter
The snow was pillin' high,
And the wind was just a screeching
As it went a tearin' by.

Two engineers with open throttles
Was a tearin' through the spray,
And each, by the orders in his fist,
Had got the right o' way;
Both were rushing for the junction,
On the train despatcher's word,
When Joe was roused from his nappin'
And this is what he heard:

"Go quick to the junction office—
Take along your signal light!
'S' has failed to deliver orders,
And both trains have got the right."
Two miles and a half to huff it
On such a fearful night,
And reach the junction office
With his crimson danger light—

And only thirty minutes
Before the trains would meet;
Joe never stopped for hat or coat,
But dashed out in the sleet,
Wild and fierce blew the wind,
And deeper piled the snow,
But Joe didn't think of either,
For he read his orders, "Go!"

He went, and how he suffered
Only God and angels knew,
But he reached the junction office
Before either train was due.
On came the rushin' engines
Till they saw the red light shine.
When two quick sharp shrieks told plainly
Joe had reached the spot in time.

He staggered to the office
To report his duty done,
Thanking God that he had saved them,
And he had the strength to come.
This is all he ever told them:
"Both trains are here with me,
And—" *He was dead, with his icy fingers*
A clutchin' the open key!

BELLE PLAINE, MINN., Oct. 24th, 1874.

Original Articles.

Organization of the American Electrical Society.—
The Constitution and By-Laws adopted.

BY OCCASIONAL.

EVER since the meeting held in Gen. Stager's room, at the Western Union office, in this city, some weeks ago, for the purpose of taking the preliminary steps for the organization of a society in this country somewhat similar to that of the Society of Telegraph Engineers in England, the adjourned meeting, to be held on the third Wednesday of October, has been an interesting and general topic of conversation among intelligent telegraphers and electricians in this section, and each seemed to realize its importance, and the necessity for doing everything possible to make it a success. Accordingly, nothing was left undone to make the permanent organization a great success.

As soon after the first meeting as practicable, the Chairman of the Committee on Constitution and By-Laws, Mr. C. H. Summers, issued a circular to the prominent electricians and telegraphers of the country, inviting their presence at the meeting, and any suggestions that they might see fit to make. Copies of this circular were also posted up in the larger telegraph offices in this city and elsewhere, and published in the leading scientific and telegraphic newspapers. The result of this united and persistent action was witnessed in one of the grandest gatherings of noted members of the profession that it has ever been my pleasure to witness since the days of the Conventions of the now defunct National Telegraphic Union.

The proprietors of the Palmer House kindly tendered the use of Parlor 27 of that spacious hotel for the meeting, and on Wednesday, October 21, at three o'clock P. M., Mr. Charles H. Haskins, of Milwaukee, Wis., the General Superintendent of the Northwestern Telegraph Company, called the meeting to order, by indicating on the table, with a pencil, "dot space dot, dot space two dots, dash, two dots, one dot, dot space, two dots."

Upon unanimous request of the gentlemen present Mr. C. S. Jones, of Chicago, acted as Secretary *pro tem*.

Mr. C. H. Summers, Chairman of the Committee appointed at the last meeting, presented a large number of letters and telegraphic despatches from gentlemen who were unable to attend, which were read by the Secretary.

Those from gentlemen east, with one exception, contained very few suggestions, other than that a more central location than Chicago be selected for the headquarters of the Society, and a name that would be more comprehensive than that proposed of "American Electrical Society." The exception referred to was from Mr. C. H. Small, of New York, who was in favor of placing the qualification for membership so high that none but the most eminent men of the country could become members, remarking that unless such was the status of the Society he should not consider it an honor to be a member. Lest the gentlemen present should suppose that he considered himself one of those eminent men, he added that, no doubt, this would exclude him, but he should immediately endeavor to fit himself, by close application, etc., to become a member. His views were not debated in open meeting, and did not accord with the ideas of those present.

The communications from gentlemen from other sections of the country contained no recommendations, simply requesting to be enrolled as members, and pledging themselves to abide by the decision of those who should be present and organize the Society.

Among the well known telegraphers and electricians who wished the Society well and desired to be enrolled as members was that operators' friend, Mr. J. D. Reid; Mr. F. J. Grae, Editor of the *Journal of the Telegraph*; Mr. J. N. Ashley, Editor and Publisher of THE TELEGRAPHER, of New York; and many others. Mr. Ashley's letter, which proffered the use of the columns of THE TELEGRAPHER in any manner that would further the objects and aid in the advancement of the Society, was very kindly received.

A telegraphic despatch from Chief Operator Johnson, of the Western Union Cincinnati office, giving his reasons for non-attendance, which was as follows: "It's a boy—ten pounds," created considerable merriment.

Mr. Z. G. Simmons, President of the Northwestern Telegraph Company, sent word that the Society could call on him for \$500 as an assessment.

The Constitution and By-Laws, which had been prepared by the committee appointed at the previous meeting for that purpose, were then read as a whole, and afterwards reread and adopted, section by section. Although no material changes were made in them, as reported, still it was deemed best to appoint a committee to retire and perfect them before final action.

During the absence of the committee for this purpose the names of those who merely acknowledged the receipt of the printed circular heretofore mentioned were read by the secretary, after which, until the committee's return, a general introduction and hand shaking was indulged in, and congratulations were heard upon all sides as the gentlemen one after another met old friends and former associates, some of whom they had worked with side by side, or over the electric cord, in "Auld Lang Syne." Some pleasant reminiscences were brought out, which, if they could be written up, would pleasantly fill many a column of THE TELEGRAPHER. The life of the gathering were, Messrs. H. C. Maynard, C. S. Jones and E. B. Chandler, of Chicago; C. H. Haskins, of Milwaukee, and N. Hucker, of Buffalo. They indulged in good natured passes at each other at every favorable opportunity, and kept others present convulsed with laughter. The meeting was throughout exceedingly pleasant and harmonious. Some fifty gentlemen were present, representing all sections of the country—many being from different cities in the

United States and Dominion of Canada. Almost every grade of the telegraphic profession was represented, from general superintendent to operators, linemen and battery men.

The sentiment expressed by the chairman at the opening of the meeting, that the object of the Society should be organization and concert to advance telegraphy, and to promote the cause thereof by the adoption of some means to distribute information gained by practical telegraphers, seemed to pervade the whole assembly.

The committee having reported the Constitution and By-Laws as amended, they were unanimously adopted, and the following officers elected for the first year:

President—General Anson Stager, of Chicago.
First Vice-President—C. H. Haskins, of Milwaukee.
Second Vice-President—George B. Prescott, of New York.

Third Vice-President—H. P. Dwight, of Toronto.
Fourth Vice-President—William Orton, of New York.

Fifth Vice-President—James Gamble, of San Francisco.

Sixth Vice-President—John Van Horne, of Louisville.

Seventh Vice-President—E. D. L. Sweet, of New York.

Corresponding Secretary—I. N. Miller, of Chillicothe, Ohio.

Recording Secretary—C. S. Jones, of Chicago.
Treasurer—E. B. Chandler, of Chicago.

Directors—F. L. Pope, A. L. Brown, New York; W. W. Smith, Indianapolis; J. A. Swift, Washington, D. C.; S. D. Field, San Francisco; George T. Williams, Cincinnati; D. Flanery, New Orleans; C. O. Rowe, Pittsburg; R. C. Clowry, St. Louis; E. P. Wright, Cleveland; D. H. Bates, Philadelphia; J. J. Dickey, Omaha; N. Hucker, Buffalo; A. G. Davis, Baltimore; J. R. Dowell, Richmond.

Executive Committee—William Henry Smith, J. J. S. Wilson, George H. Bliss, F. H. Tubbs, C. H. Summers, all of Chicago.

General Stager, having been conducted to the chair, made a few remarks thanking the members for the honor they had conferred upon him, returned thanks on behalf of the rest of the officers elect, and promised to leave nothing undone to further the interests of the Society.

It was resolved that a copy of the proceedings be furnished to THE TELEGRAPHER, the *Journal of the Telegraph*, and the press generally, for publication.

A resolution of thanks to the proprietors of the Palmer House for the facilities afforded was also adopted.

The following gentlemen came forward, paid their initiation fee and first year's dues, and thus signified their willingness to become members: F. M. Speed, M. C. Bristol, Geo. T. Williams, of Cincinnati; E. P. Wright, Cleveland, Ohio; I. N. Miller, Chillicothe, Ohio; R. B. Woolsey, Mattoon, Ill; Hugh Neilson, Toronto, Canada; Charles O. Rowe, Pittsburg, Pa.; E. S. Norcross, E. R. Parenteau, Terre Haute; W. W. Smith, Indianapolis, Ind.; N. Hucker, Buffalo, N. Y.; Charles W. Ross, Columbus, Ohio; J. J. Dickey, Omaha, Neb.; Charles Smith, Louisville, Ky.; C. H. Haskins, Milwaukee, Wis.; Anson Stager, J. P. Barrett, E. B. Chandler, James S. Dickinson, Thos. Orton, Geo. C. Felton, J. P. Towler, W. C. Long, H. Stanberry, C. H. Summers, C. S. Jones, E. P. Warner, H. C. Maynard, W. O. Hopkins, L. B. Firman, S. S. Robinson, F. W. Jones, A. B. Peck, Chicago.

The regular meetings of the Society were fixed for the third Wednesday in each month, the annual meeting to be held on the third Wednesday in October. The next meeting of the Society, it was understood, would be at the call of the Executive Committee.

The following is the Constitution and By-Laws, as finally adopted:

CONSTITUTION.

Art. 1.—This association shall be called the American Electrical Society.

Art. 2.—The object of the society shall be the interchange of knowledge and the professional improvement of its members; the advancement of electrical and telegraphic science, and the establishment of a central point of reference.

Among the means to be employed for attaining these ends shall be periodical meetings for the reading of professional papers and the discussion of scientific subjects; the foundation of a library; the collection of electrical instruments, models, drawings, maps, &c., and the publication of such parts of the proceedings as may be deemed expedient.

Art. 3.—This Society shall consist of members, corresponding, and honorary members, and each person, when duly elected and qualified, shall receive a certificate of membership, indicating the particular class which he represents.

Art. 4.—Candidates shall be proposed at one meeting and balloted for at the next regular meeting, and, to be

ected, must receive three fourths of the votes cast, but the society may, by the unanimous vote of the members present, elect any candidate at the meeting at which he is proposed.

Art. 5.—On being elected the candidate must subscribe to the Constitution and By-Laws, and pay the sum of five dollars, membership fee, before he can be entitled to receive his certificate.

If this is not done in sixty days from notification of election, said election shall be considered void.

Art. 6.—Persons residing out of America may be elected corresponding members in the same manner as hereinbefore provided for the choice of immediate members.

Art. 7.—Honorary members, having been nominated as required in article 4, may be elected by a unanimous vote of the members present. They shall not be required to pay any contributions. No person shall be considered as a corresponding or honorary member unless he signify, within three months of his notification of election, his acceptance of membership.

Art. 8.—Each member shall pay as initiation fee the sum of five dollars, as provided in article 5, and a further sum of two dollars per year toward the support of the association.

Art. 9.—No member whose dues are three months in arrears shall be entitled to vote, nor to receive the society's printed papers.

Art. 10.—Any member shall have the privilege of introducing strangers to the rooms of the society on writing their names in the visitors' register, or sending with them a card signed with his name.

Art. 11.—There shall be a fund, called the fellowship fund, devoted exclusively to the publications of the papers read before the society; any person, whether member or otherwise, may subscribe thereto.

Art. 12.—At any regular meeting of the society fifteen members shall constitute a quorum for the reception and consideration of applications for membership, and the transaction of such business as may be reported by the Executive Committee.

Art. 13.—The officers of the society shall be a President, seven Vice-Presidents, a Corresponding Secretary, a Recording Secretary, a Treasurer, fifteen Directors, and an Executive Committee of five resident members, who shall be elected by ballot, by a majority of votes at the annual meeting of the society, and shall hold their offices until their successors are chosen and qualified.

Any vacancy that may occur, by resignation or otherwise, shall be filled at the next monthly meeting after notice of such vacancy.

Art. 14.—The President, Recording Secretary, Treasurer and Directors shall be the trustees of this society.

Art. 15.—The President, and in his absence the Vice-Presidents in rotation, shall preside at all meetings of the society, and in case of their absence a President *pro tem.* shall be appointed.

Art. 16.—The duties of the Corresponding Secretary shall be to conduct all correspondence other than that relating to the local affairs of the society.

Art. 17.—The Recording Secretary shall keep an accurate record of all the transactions of the society, and of the Executive Committee, and shall issue all notices, and prepare all necessary blanks.

Art. 18.—The Treasurer shall have charge of the funds of the society, shall receive all assessments, and pay all bills and orders approved by the Executive Committee.

Art. 19.—The duties of the Executive Committee shall be to have a general care of the affairs of the society, examine and approve all bills and demands, audit the accounts of the Treasurer, certify to his annual report, and make report of their transactions for the year at the annual meeting.

Art. 20.—Initiation fees and annual dues shall be paid at the time the member elect subscribes to the Constitution and By-Laws, and regular dues at every annual meeting thereafter.

Art. 21.—The annual meetings shall be held on the third Wednesday of October in each year, at such place as the Executive Committee may designate. The headquarters of this society shall be the City of Chicago.

Art. 22.—Proposed amendments to this Constitution shall be first submitted to the Executive Committee, then sent by letter to the several members of the society, at least thirty days previous to the annual meeting; such amendments shall be in order for discussion, and shall be voted upon at such annual meeting in person or by proxy; votes shall be counted by the President and Secretary, and if two thirds of the votes cast are in favor of said amendment it shall be declared adopted.

BY-LAWS.

1.—The regular meetings of the society shall be held on the third Wednesday of each month, at which papers may be read relating to the theory and practice of telegraphy and electrical matters generally, or other subjects properly coming under the head of Article 2 of the Constitution.

2.—At the regular meetings of the society the fol-

lowing order shall be observed in the transaction of business, unless set aside by a vote of members present:

First—Record of the previous meeting to be read, approved and signed by the Chairman and Secretary.

Second—Proposals for membership.

Third—Candidates for membership to be balloted for.

Fourth—Communications received since the last regular meeting to be announced and read, if required.

Fifth—Communications from members present to be read.

Sixth—Communications from the Executive Committee to be brought forward.

Seventh—Report of committees to be called for.

Eighth—Unfinished business to be taken up

Ninth—New business to be proposed.

Tenth—Questions for debate to be discussed.

3. All decisions of the chair on points of order shall be conclusive, unless reversed on appeal to the meeting.

4.—Every motion shall be first stated by the President before debate, and every motion shall be reduced to writing if the President or any member desire it.

5.—Cushing's Manual for the Government of Legislative Bodies shall govern this society in its deliberations.

6.—If required by one fourth of the whole number of members present the yeas and nays upon any question shall be called and entered upon the journal.

7.—No motion for reconsideration shall be in order unless one of the majority shall move such reconsideration.

8.—The Executive Committee may call meetings of the society when they deem it expedient, and shall be bound to do so upon the written request of seven members, stating the object of such meeting. Seven days' notice shall be given to members of any special meeting, the purpose thereof to be stated in the notice, and no other business shall be taken up at that meeting.

9.—The rooms of the society shall be open at such hours of every day as the Executive Committee may prescribe.

10.—A record of all donations to the society, whether in money, books, maps, instruments, models or other articles of value, with the names of the donors, shall be entered by the recording secretary (in a book provided for that purpose) to be kept at the rooms of the society.

11.—The books, maps, instruments and other property of the society shall only be removed from the rooms under such rules and regulations as shall be prescribed by the Executive Committee.

12.—The records of the society shall at all times be open to members, and such books of accounts shall be kept in its rooms as the Executive Committee may designate.

13.—When a paper is presented to the society the recording Secretary shall report thereon to the Executive Committee, who shall then determine whether such paper shall be published or filed.

14.—No indebtedness shall be incurred for the society except under such rules as shall be prescribed by the Executive Committee.

15.—No bill shall be paid for the society until it has been certified by the person authorized to contract it and audited by the Executive Committee.

16.—Additions and amendments may be made to the By-Laws at any regular meeting, provided they have been proposed in writing and seconded at a previous regular meeting.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Plug and Nihil Nameless.

CINCINNATI, OHIO, Oct. 28th.

TO THE EDITOR OF THE TELEGRAPHER.

"Said the wind to the moon, 'I will blow you out!

You stare in the air,

Like a ghost in a chair,

Always looking what I am about.

I hate to be watched! I will blow you out."

You have so kindly opened your columns to me heretofore, that I have concluded to ask this one more favor of you, and I think I can promise you that it will be the last. Had the matter not developed itself into a case of self-defence, I would not ask to occupy your space again. I am aware that the personal concerns of men in general are not of much interest to any but themselves, and hence are only cumbersome to the columns of a journal. Your paper, too, is conducted in a manner which shows that great pains are taken to make it valuable to its readers. I may not be brief, but I will be to the point.

The first contribution, you will remember, had reference particularly to the unkind remarks made in the "Plug," concerning the operators in the room, to which its circulation is mostly confined. I objected then to the style of those squibs more than to the act of squibbing.

The editorial reply to my contribution came out in haste. The editors certainly lost no time in "rushing into print" with those ponderous brains of which he who writes under the caption "73" boasted so loudly at first. He scented his prey with the keenness of the eagle, and soared aloft wonderfully on the wings of his intellect, screaming with delight as he soared, in anticipation of the easy victory and the gory feast. He asserted that his quarry was a fool, but, nevertheless, whetted his beak and sharpened his talons that he might bury them the deeper in the quivering flesh of his hapless victim. No emotions of pity for the helplessness of his prey melted the iron fierceness of his heart. He would not be content to frighten the poor despicable object that crawled upon the earth beneath him. Not he. Nothing short of Nihil-ation would satisfy his royal eagle heart. He would Nihilate me—that he would. Well, he has had his editorial say. He has well nigh filled the columns of the paper he edits with his reply, and, I suppose, only sheathed his sword for lack of Plug room; and still the fool is cheerful as ever, in the full and free possession of his faculties, such as they are, and rejoicing in his usual health. A careful review of the controversy thus far may confirm him in his belief in his editorial capacity, as at first expressed, but will also develop the fact that with him resists the very questionable credit of having resorted to the use of such terms as fool and ass. These words, or such as these, are sometimes used, no doubt, by wits, but it is generally conceded that a resort to them is only evidence of a lack of better and more effective weapons—a sign of internal weakness. I am perfectly willing to abide by his own decision in years to come. When the buffetings of sorrow and misfortune shall have muffled his eagerness, when experience shall have taught him that confidence is not always knowledge, egotism not always wisdom, when his best laid plans and most cherished schemes shall have been dashed to pieces before his eyes, I say I shall be perfectly willing to submit to his own decision, at such time, of the question whether he has pursued the best and most gentlemanly course. I hope the day of his sorrow may be far off. I certainly wish him naught but good fortune and happiness, but I know that misfortune and sorrow are the common lot of us all. When death shall have entered his dwelling and taken his all; when he shall have had my experience with the world's bitter sorrows and its useless regrets, with its unsympathizing friendships and hollow hearts; if such time ever come—I hope sincerely it may not to him as to me—he will have learned that there are days, nay, even years, when the rude laugh and mocking jest fall harshly on the ear—when such ribald sneers as have filled the personal columns of his paper will have lost their pleasant sound—when the mind ceases to take pleasure in the vanities of the careless friends around. Should such time come, he will have learned that the dullest of us may have gentle feelings and tender sensibilities; he will have learned to think more kindly of him he so sneeringly names the "Melancholy Dane," little as he is able now to enter into his feelings.

I do not anticipate a very prolonged nor glorious career for the paper he edits, for the reason I gave in my first, viz: It is not properly conducted; the editors do not adapt themselves to the needs or capacities of the men for whom they publish; neither do I think, they apprehend them rightly.

Nor do I anticipate any very extended or glorious editorial career for him whose name appears first on the editorial staff, because I do not think he possesses the requisite mental poise necessary to make a shrewd, discriminating, judicious manager of a journal of that, or, indeed, and other kind. We have many men in Ohio who imagine themselves fully able to edit any paper, but those who really are able can be counted within a score.

I shall not prophesy as to how soon he will find this to be true; I shall not even predict that he will ever learn it, but that others, both now and in the future, will recognize it as a true prognostication, I do not at all doubt.

I say this with a kindness of feeling that the Managing Editor of the "Plug" will find is proof against a mountain of such puerile missiles as fool and ass; with a kindness of feeling that only smiles at his puny efforts to irritate into resentment by using the childish language of a wrathful boy; with an equanimity of temper totally unflurried by the windy storm of words which was to Nihilate me.

To the editorials of the elder of the two editors of the "Plug," I have made but brief references. It may not be amiss to say that there is a good and sufficient reason for this. His articles have been generally the best, by heavy odds, in the paper. Whatever of dignity

has belonged to the columns of the "Plug" has been the fruit of his brain. An older man than the other, life has taught him some lessons that are yet sternly in store for his younger brother, and the evidences of this are to be seen in the demeanor of the man, no less than in silver threads which are beginning to appear in his hair. For his kindness of heart and honesty of intentions I have the highest respect; for his sorrows and his cares, the warmest sympathy; and I would not, if I could, add a hair's weight to them. I hope, for his sake, for in his connection with the "Plug" may be brief, for in it he can win no laurels which it will not cause him shame hereafter to wear. His work as an operator has always been honestly and efficiently done, and that he does not occupy a more remunerative position to-day only adds proof to the well known truth that he who works best often gets the worst pay. The younger of the two makes the very common mistake of estimating his own wit, and is, perhaps, not to be blamed that he has set the figures a good deal too high. A slight idea of the coherency of things in regard to the publication of the "Plug" may be gathered from the singular (to say the least) fact that a clipping from the "Cincinnati Commercial" of October 15th occurs in the "Plug" of October 1st, published (by its own date) just two weeks before the "Commercial" went to press. Odd, isn't it? Would it not be well, while he is suggesting loops from one end of the building to the other, for the convenience of the operators, to take a "loop" in the paper, so as to enclose distant dates? They will not then be starting so continually into view from beyond the circuit; or, how would it do to switch in a repeater by putting in a "Plug," somewhere between dates, which would fill up an awkward blank, and not leave subscribers from the 15th of September to the 27th of October without a "Plug?" What sad calamities might have happened in all that time without the "Plug!" I can only account for it by supposing that the poor, overworked brain has wearied of its task and sank to needed repose, or that Nickel-ous gave out and Credit was low; by the way, is it not seldom the case with editors? I notice, too, that the "Plug," is not "wearing of the green" any more. One good result at least, then, has been accomplished; green is the complimentary color of red and blue—which means, I suppose, that when we have paid our money and read the paper we are a "Nickelo out of pocketo," and feel blue. In regard to the quotations from Shakespeare, I would say that, notwithstanding the fact that they are not quite literal, I certainly think them decidedly superior to the general matter of the "Plug," and I would suggest that the subscription list might be very largely increased if the editor would take up one of Will's plays and publish it in serial form. Adapted to the size of the paper, with its present type, it would furnish valuable reading for some years to come. Probably by the time Hamlet, for instance, shall be finished, most of the present subscribers will have gone to their graves at a ripe old age, and the W. U. Tel. Co. numbered with the things that were. So it will have answered a good purpose as profitable and cheap reading for the masses—of operators. Watts' hymns might be thrown into the corner as humorous poetry. And then, perhaps, in the distant future, when this play shall have been all published, some operator yet unborn may stand "in lonely contemplation" by the present editor's tomb in silent meditation on his merits and his fame, and thus soliloquize, "Alas, poor Yorick!" And is this he who once so bravely said—"Come again, Nihil, and we will nihilate you?"

At last he says "Farewell!" and I, feeling the tenderness of the occasion, though I cannot help thinking "Where ye ganging till," say also—Farewell, 'tis hard to give thee up.

"Here's a health to ye, Jamie, my dear,
Where'er ye may journeying gae;
May ye find monie friends,
Wi' muckle to lend,
For little your ain will ye hae.

Nihil NAMELESS.

Advantages of T. M. B. Association.—A New and Superior Relay.

CHICAGO, Nov. 2d.

TO THE EDITOR OF THE TELEGRAPHER.

THE excitement in consequence of the formation of the American Electrical Society being over, the next thing in order, and that which is taking up the attention of a portion of the fraternity, at least in this section, is the coming annual meeting of the Telegraphers' Mutual Benefit Association. The action of the meeting of this district, recently, seems to have met the approbation of those belonging in this district who were unable to be present, as no further meetings have been called. There is very little doubt but that Mr. F. W. Jones (the agent of this district, who was appointed as delegate to the annual meeting of the Association in New York the 11th of this month) will attend that meeting in person, and there present the

views of the members of the Association in this district.

The Association has long since become an established fact. It has done a great deal of good, and the members and those intending to join the Association should study to understand more fully the real principles of the Association. They should feel and know that the interests of each and every member are identical.

The Association is pledged to pay the heirs of the deceased members the proper amount, and the members by joining the Association pledge themselves to stand by it and pay their assessments.

A certain number are sure to die every year; no one is so gilded as to know what length his lease of life may be; we dare not look about us to see who will be the next to fall, for fear we should see the reflection of our own face.

The fact that the heirs of the deceased have at the proper time been paid what has been laid up for them by the thoughtful prudence and foresight of their dependence in life, should be a sufficient guarantee that the Association will deal as honorably with their loved ones. As assessments occur from time to time it illustrates the uncertainty of human life, and we should be taught thereby to be prepared in every way for the transition from this mundane sphere.

In regard to the cheapness of this mode of insurance, to look at it from no other standpoint, a review of the cost from year to year will show that it is one of the cheapest modes of insurance in existence. You pay only the amount necessary to pay the losses of the Association by death.

It is an absolute condition of your contract, if you are already a member, that the payment of each assessment when it becomes due is the only way to perpetuate your insurance and protect your family.

The necessity for such an Association is clearly demonstrated by the number of subscription papers being circulated for the benefit of families of deceased operators, who from some cause either did not join, or, if they joined, allowed themselves to become delinquent members, and died delinquent to the Association. As the Association is now pledged to pay a certain amount, the death of a delinquent results disastrously only to his family not to the Association. In concluding these remarks about the Association, I would like to impress upon every member of the fraternity all over our broad land who is still in good health, the duty they owe their families and urge them to join the Association at once. The larger the membership the lighter the assessments, as the ratio of deaths never increase in proportion to the ratio of new members; where one dies a dozen join.

I think the correspondent who keeps you informed as to the births, marriages, etc., in this vicinity, rather slighted our friend Ed. Whitford, of the W. U. office of this city, as he was made a happy father some three months since by being presented with a fine daughter, a regular "giant sounder." I have scanned the columns of THE TELEGRAPHER for some time in hopes of seeing an account of the *debut* into Chicago society of the aforesaid young lady, and cannot wait a "whit" longer.

Among the rising young men of our city, scientifically, I think should be mentioned the name of Mr. E. P. Warner, one of the original members of the American Electrical Society. He is at present employed as a mechanic in the Western Electric Manufacturing Company's shops in this city. His native modesty kept me from making his personal acquaintance until quite recently. Mr. Warner has for some time past been turning his attention to the perfection of a new style of relay, which I will call the "Warner Relay." It differs very materially from anything of the kind I have ever seen, not only in principle but in mode of construction. It has recently been tested on several of the Western Union wires in this city. On the St. Paul wire, where a Western Union relay of 640 ohms was required to work the circuit, Mr. Warner put in his relay, which he had not yet perfected, made out of pieces of old instruments, measuring but 140 ohms, and it worked better than the Western Union relay. The circuit was working very heavy, it being very difficult to send with the Western Union relay in circuit, but with the Warner relay it was almost as easy to send as on a short circuit. On the Buffalo circuit, where a 640 ohm W. U. relay was used, one of Warner's of 80 ohms worked very satisfactorily, and one of 150 ohms (Warner's) worked better than the 640 ohm Western Union.

One of 80 ohms was also worked on the Milwaukee duplex (Stearns bridge system) very satisfactorily.

I am sorry I cannot more fully enlighten you by a diagram of the relay. The following explanation will have to suffice for this time:

The retaining force of the iron cores are greatly reduced by making the electro-magnets but one half the length of the shortest used on the best style of horseshoe relays.

No armature has to be magnetized by induction from the poles of the electro-magnets. The cores (one of which acts as an armature) are simultaneously mag-

netized by the same current, and polarized in such a way as to attract each other. This arrangement is free from the difficulties experienced in magnetizing soft iron armatures, where they retain their polarity for a short time after the current ceases, and do not become fully charged at the instant the current passes through the coils. The permanent magnet induces the same polarity upon the extensions of the movable core as is done by the current through the coils, and when the magnetism induced by the current is in excess of that induced by the permanent magnet, the latter gives the movable core a repulsion in the direction of its movement, with a force proportionately to the excess. It is necessary that the line current should flow through the coils always in the same direction, in order to produce the best effects, and this direction is decided by the polarity of the battery. A little commutator, the arrangement of F. W. Jones, is attached to the base of the relay, so that one move to the right or left instantly reverses the coils in the circuit.

OCCASIONAL.

The New Western Union Office at Boston, Mass.

BOSTON, MASS., October 29.

TO THE EDITOR OF THE TELEGRAPHER.

THE main office of the Western Union Telegraph Company in this city had been located for so long a time at 83 State street that the location had come to be considered as permanently dedicated to telegraphic use. The increase of the business has, however, gradually outgrown the accommodations, and it has been evident for some months past that better quarters must soon be obtained, where more room and more suitable arrangements could be had. It would, perhaps, be interesting to write up the various telegraphic changes which have taken place since the upper story of the *Traveller* building at 31 State street sufficed for the accommodation of the companies and lines which were consolidated into the American Telegraph Company, but for this there is neither time or space at present. There are still in this office several who have been continuously employed here during all this time, who have witnessed the expansion and increase of the business as it has outgrown the quarters which have been from time to time provided for it, necessitating removals from premises which were originally supposed to be ample to accommodate it.

Several weeks ago preparations were commenced and have actively continued for the removal of the office from 83 to 109 State street, where it is in future to be located until such time as even more extensive accommodations shall be required.

The transfer was effected on Sunday, the 25th of October, much to the gratification of all parties concerned, especially the operators, to whom, for some time past, pure air in working hours has been unattainable.

As yet the finishing and ornamentation of the new office is incomplete, yet the improvement over our old quarters are evident to every one who may see the two places.

The receiving office is a large, beautifully fitted up apartment, heated, as is the building throughout, by steam, which is also the motive power of the establishment. The desks and counter are of New York manufacture, and are almost the counterpart of those in the main office in the metropolis. The messages are transmitted from the receiving office to the operating room by pneumatic tubes, which are placed conveniently for the use of the receivers, thus greatly facilitating the work of the office.

In the rear room, which fronts on Doane street, is the delivery department, where the delivery clerks and messengers are accommodated, and find their new quarters much pleasanter and more accessible than the cellar room which was allotted to them in the old building.

A portion of the second story will be occupied by the officers of the Associated Press, and the other rooms on that floor are let to other parties for offices.

On the third floor are the apartments for the lady operators, the office of the Superintendent, etc. The battery room, in which there are 1,750 cells of Callaud battery, is in the fourth story, where are also located the cloak rooms, etc.

In the fifth and topmost story the operating room is located, which has been remodelled for its present use, and the floor so laid with traps that any section of the wires may be easily reached.

The switch is of the ordinary plug pattern, and one of the most perfect and complete manufactured, while all the appurtenances of a well appointed office, printing and copying machines, etc., to be found in good working order. There are sixteen instrument tables in this room, with accommodation for four wires, with an extra table for the repeaters.

In a few days the new gas fixtures, and the other indispensable et ceteras not yet completed, will be in readiness for use, and then the Western Union will have a Boston office worthy of the city and the company.

O. P. R.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, NOVEMBER 7, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

TERMS OF SUBSCRIPTION.

One Copy, One Year, - - - - \$2.00.

INVARIABLELY IN ADVANCE.

Single Copies Five Cents.

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In lieu of the above, or any other premiums that may be offered from time to time, telegraphers, or others, who may act as agents and canvassers in obtaining subscriptions, if they so desire, will be allowed twenty per cent. commission on the amount collected, which may be deducted from the remittances for such subscriptions.

SPECIMEN COPIES FORWARDED FREE on APPLICATION.

Communications must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503.)

38 VESEY ST., New York.

EXTRA INDUCEMENTS TO OBTAIN SUBSCRIPTIONS FOR THE TELEGRAPHER.

It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST OF THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

THE TELEGRAPHER is the only generally recognized and established representative of the

TELEGRAPHIC FRATERNITY

in the United States and the Dominion of Canada, and, as such, has long enjoyed the confidence and approval of the great body of the telegraphers. Every effort has been and will be made to not only maintain but increase its

VALUE AND EFFICIENCY.

It is no ephemeral publication, but is a successful and firmly established journal, as is demonstrated by the fact that it has regularly appeared for

MORE THAN TEN YEARS,

having been enlarged from time to time, as its increasing patronage has warranted.

It is hoped that, recognizing the value and importance of the paper, the telegraphers generally will renew their efforts to immediately and largely

INCREASE ITS CIRCULATION.

To give everybody a chance to

PARTICIPATE IN THE PREMIUMS

the following offer is made:

FOR TWENTY SUBSCRIPTIONS,

to the person forwarding the names and money a No. 1 TELEGRAPH HOUND, or NOAD'S STUDENT'S TEXT-BOOK and CLARK ON ELECTROCAL MEASUREMENT, or any other Electrical or Telegraphic works of equal value.

FOR FIFTEEN SUBSCRIPTIONS,

THE FAIRY ELECTRIC ENGINE, or a set of F. L. POPE & Co.'s popular NONPAREIL TELEGRAPH APPARATUS.

FOR TEN SUBSCRIPTIONS,

an elegant Gold TELEGRAPHER'S BADGE PIN.

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Publisher.

Excellent and Successful Telegraphic Management and the Result.

In the last number of THE TELEGRAPHER, in commenting upon the Annual Report of President ORTON, we incidentally alluded to the management of the Montreal Telegraph Company and its satisfactory results to the stockholders and the public. It has occurred to us that the subject could be profitably treated more at length, and the contrast to the management and results of telegraphic enterprises in the United States generally is so striking, that it may serve a useful purpose to present the matter for the consideration of those who may be engaged in initiating or managing similar enterprises here.

The Montreal Telegraph Company was organized in January, 1847, commencing business in July of that year, with a line between Toronto and Quebec, a distance of 540 miles. The amount of the original capital was \$60,000, which it will be conceded was by no means excessive for the length of the line. The company appears to have been carefully and economically managed from the start, Sir HUGH ALLAN, its President now, and Mr. JAMES DAKERS, its present Secretary, having been originally connected with its management. A definite policy, and, as it has proved, a very wise one, was adopted, which was to pay to the stockholders a reasonable dividend on their investment from the proceeds of the business, and devote the surplus, whatever it might be, to extending and strengthening the lines and furnishing additional facilities, as they were required. This policy has been steadfastly adhered to up to the present time, and under it the line has been exceedingly profitable to the fortunate holders of its stock; the public has been provided with adequate telegraphic facilities as they were needed, and the company has become one of the leading telegraphic organizations of the Continent. A dividend of ten per cent. has been paid to the stockholders every year since 1847, with the exception of two years, in which the dividends were eight and nine per cent., respectively. The surplus expended in extending the lines has been returned to the stockholders as a stock bonus, from time to time. In this manner the capital of the company has been increased from \$60,000 to \$1,750,000, and its lines have been extended throughout the present Canadian Dominion—the greatest length of line now worked by the company being 1,750 miles. The company now owns and operates 12,000 miles of poles, 18,000 miles of wire, and has 1,300 offices. It will be seen that the present capital of the company is by no means excessive, being only \$146 per mile of poles owned by the company. The lines and equipment are kept in excellent condition, and ready for any demand which may be made upon them. The tariff was reduced, from time to time, until January 1, 1870, when the low rate at present existing was adopted, and the company has now a uniform tariff to all Canadian points of twenty-five cents (gold) for a ten word message—date, address and signature free, as on United States lines—and one cent for each additional word. To this there is but one exception. When the distance is less than 12 miles the rate is 15 and 1 (gold). The American currency rate of the company is 30 and 2. At the time this reduction was made it was regarded by telegraph managers and others on this side of the line as a hazardous one, but the result has proved that the managers of the company acted intelligently, for the reduced rate has proved not only satisfactory, but profitable—the revenues having steadily increased.

In the management of this model company there is no expensive red tape, everything being simplified as much as possible, as we understand; and while the agents of the company are held to a rigid accountability, it is not considered necessary to expend a dollar to discover a possible discrepancy of ten cents.

The Montreal Telegraph Company has no debt, either bonded or floating, and it is hardly necessary for us to state that its stock is held in high estimation by investors. The shares, whose par value is \$100, are held

at \$195, and are seldom to be obtained even at the latter figure.

It should be remembered in this connection that the territory covered by the company is much inferior telegraphically, to that of the principal United States companies, being more sparsely settled, and embracing but few large cities or places, and none equalling many in our own country. It cannot be said either that the company has not had active competition to contend against. During its existence several competing telegraph companies have been organized, and the Dominion Telegraph Company, now in successful operation, is by no means a competitor to be despised, and is pursuing, under its present management, a policy similar to that of the Montreal Company, and with satisfactory results. The Dominion Company is yearly extending its lines, and the season now closing will have added 700 miles of line to that which it previously had. This company is also paying dividends regularly to its stockholders—that for last year, and we believe for the year previous, having been at the rate of 5 per cent. In fact, telegraphic enterprises that do not pay dividends are not much in favor with our Canadian friends.

We do not know of any existing telegraph enterprise in this country, with the exception of the Northwestern Telegraph Company, which can compare favorably with those of which we have been stating the simple facts. We do not desire or intend to make any invidious comparisons, but these facts and figures are certainly suggestive, and worthy of the earnest consideration of our telegraphic managers, and especially of those who may have in view the inauguration of any new telegraphic enterprises. We have frequently pointed out what have appeared to us to be errors in telegraphic management, which stand in the way of satisfactory pecuniary results. One of these is much too common, and cannot but be considered a very damaging one—that is starting companies with an inflated nominal capital, selling shares at a quarter to half their nominal price, and distributing large amounts of bonus stock to promoters and contractors for which in fact no equivalent is received. If the nominal capital of a telegraph company represented only the actual investment at the start, and was increased only as the property of the company was increased, by expenditure of revenue or by additional investments, it will be seen that a heavy load which most of our telegraph companies have to carry would not encumber it and prevent its pecuniary success, and the money would be more carefully looked after and economically expended. It is time that American investors should get over the fallacy which has seemed to possess so much attraction, and been believed in quite generally, that dividing a dollar into two or more parts will give the holder two or more dollars, as the case may be, while in fact the result is merely to impair or destroy its intrinsic value. Inflating the capital of a telegraph or any other corporation only decreases the ability to pay dividends on the nominal amount.

With a reasonable capital representing the actual value of the property, and economical management, there is no reason why telegraph companies in this country should not show results at least as favorable as that of the Montreal Telegraph Company. There must in such case be no "rings" to absorb the profits, either in extravagant salaries or profitable pickings to the officials or contractors, in which the shareholders do not generally participate. The lines must be managed for and in the interest of the investors and of the public, for whose service they are supposed to be constructed and operated. While remunerative prices should be exacted for the service rendered, these should be as reasonable as is compatible with the proper and adequate compensation of the employes, the maintenance and extension of the facilities, as required, and a reasonable return for the investment will permit.

We should very much like to see a national telegraphic enterprise thus established and conducted in this country, and have no doubt but that its success would be assured, even with all the odds that might

exist against it at the start. If the lines and companies now competing with the great telegraphic corporation of the country could be brought under one control and management, and consolidated on a fair and reasonable basis as regards capital, we have no doubt but that the additional capital required to extend and complete the system could be obtained with very little difficulty. The obstacles to such a consolidation, so far as the majority of their stockholders are concerned, are by no means so formidable or difficult to be overcome as is generally supposed, and we once more renew our oft repeated and urgent recommendation that they shall, in their own interest and for the general welfare, take such action as may be necessary to bring about the result which all concerned admit to be desirable and necessary, but which, up to the present time, very little effort has apparently been made to secure.

The Direct United States Cable.

WE learn by cable despatches that the contractors for the Direct United States Cable have succeeded in recovering the lost end of the cable, and have spliced it to the cable remaining on board the Faraday, and at the last advices were making good progress in laying the remaining section to the Newfoundland coast. Should no further misadventure occur, we shall probably have the pleasure next week of announcing the completion of the cable, and the inauguration of competition in Atlantic telegraphy.

The contractors deserve much credit for their enterprise and perseverance in recovering the cable at this late season of the year, and in completing the task which had been generally considered impracticable before another season. It is gratifying to know that the cable was found to be in perfect condition, and there was nothing to prevent the immediate completion of the task which had been so unexpectedly delayed.

The Fairy Electric Engine.

THIS beautiful electric toy, which is advertised by the ELECTRIC MAGNETIC Co. in the THE TELEGRAPHER, will be found worthy the attention of those who are looking for something which shall interest and amuse them, or for presents, etc. It is very simple in construction, and substantially built. It has the advantage of the small steam engines which have heretofore been so popular, in that it requires no fire or apparatus for generating steam, and that while they can be run but a few moments at a time, this will run continuously for weeks if required, without any attention. It is sold with or without battery, as may be desired. The battery furnished by the company is the celebrated and popular Eagle Metallic Battery, which is manufactured by Messrs. F. L. POPE & Co., and which is coming into general use.

As the holiday season is at hand when presents are in order, and to enable telegraphers to obtain these engines without expense to themselves, we have decided to offer it as a premium for FIFTEEN yearly subscriptions to THE TELEGRAPHER. It is not a difficult matter to obtain that number of subscribers for so useful and popular a journal as THE TELEGRAPHER on almost any circuit, and we hope to be called upon for many of these engines as premiums between this and New Year.

The Telegraph.

By Cable.

RECOVERY OF THE DIRECT UNITED STATES CABLE.—THE WIRE IN PERFECT CONDITION.

LONDON, Nov. 2.—The cable of the Direct United States Cable Company, which parted and was lost while being laid by the Faraday, has been picked up by that vessel in latitude 50 deg. 31 min., longitude 24 deg. 19 min., at a depth of 1,871 fathoms. The cable is in perfect condition. It was spliced to the portion remaining on the Faraday at eleven o'clock this morning, and the work of paying out again commenced.

Extension of the Gold and Stock Telegraph Lines.

THE lines of the Gold and Stock Telegraph Company in this city have recently been extended from Forty-first street and Lexington avenue to Forty-fifth street and across to Seventh avenue; also from Forty-fourth street and First avenue to Seventy-fifth street and First avenue. The poles are 50 and 55 feet in length, and are arranged to accommodate 25 wires.

The lines of this company now extend from Rector and Greenwich streets across the Battery Park to Water and Pearl streets, which is the main line, the poles being 65 feet in length, and carrying 74 wires. From Rosevelt street continuing on to the Jackson street cable, crossing to Brooklyn with forty-five Brooklyn wires. From Rosevelt street the Uptown line continues up the Bowery and Fourth avenue to Thirty-second street, and thence by Lexington avenue to Forty-fifth street. The poles on this route carry 25 wires.

Another branch leaves the main line at Oliver street, continuing along Henry and Allen streets to First avenue and up First avenue to Seventy-fifth street, crossing at Forty-fourth street to Lexington avenue, and thence on Forty-fifth street to Seventh avenue.

On the west side of the town the line commences at Canal street, on North River, and runs up to Thompson street, through Thompson street and Greenwich avenue to Seventh avenue and Fifty-ninth street to the North River again, with 25 wires.

Their Brooklyn system of wires is very extensive.

All these lines were constructed by the veteran contractor and line builder, Mr. Robert Brown, who has done more towards covering New York streets and avenues with telegraph poles, probably, than any other person extant.

Foreign Telegraphic Notes.

THE traffic receipts of the Eastern Extension, Australasia, and China Telegraph Company, for the month of September, 1874, were £18,163, against £19,128 for the corresponding period of 1873.

The Eastern Telegraph Company's traffic receipts for the month of September, 1874, were £28,208, against £33,172 for the corresponding period of 1873.

The traffic receipts of the Great Northern Telegraph Company for the month of September were: This year 427,121 francs; last year 334,781 francs. Total traffic receipts from 1st January to 30th September: This year, 3,341,583 francs; last year, 2,388,131 francs.

The number of messages (of twenty words) passing over the Barcelona-Marseilles cable for the month ending September 30, 1874, was 5,940.

The New Washington (D. C.) Police Telegraph Lines.

THE new police telegraph lines, constructed by the Board of Police Commissioners, under the superintendence of George C. Maynard, have been completed and put in operation.

The system is much more extensive and complete than the old one, and gives the Chief of Police direct and constant communication with all parts of the District. There are five separate circuits leading from headquarters, as follows:

Circuit No. 1.—To Lieutenant Eckloff's station, 9th and K streets; Lieutenant Green's, Twentieth and K streets; Lieutenant Hurley's, Georgetown and to Tenallytown.

Circuit No. 2.—To Lieutenant Noonan's, Seventh and Boundary streets, and to Brightwood.

Circuit No. 3.—To the Reform School on the Bladensburg road.

Circuit No. 4.—To Lieutenant Kelly's, First and F streets, and Benning's Station, on the Baltimore and Potomac Railroad.

Circuit No. 5.—To Lieutenant Skippon's, Central Guard-house; Lieutenant Gessford's, Four-and-a-half and E streets, southwest; Lieutenant Austin's, Fifth and E streets, southeast, and Government Hospital for the Insane.

The total length of line is about twenty-five miles. Substantial poles have been set on all the routes, the best American wire, and Brooks' patent insulators have been used, and the system is the most perfect of any police telegraph in the whole country.—*Washington Chronicle.*

The Telegraphers' Mutual Benefit Society.

AT a meeting of the members of the Buffalo, N. Y., District of the Telegraphers' Mutual Benefit Association, held October 24, 1874, of which Mr. Thomas A. Laird was chairman, and Mr. D. T. O'Reilly was secretary, the following resolutions were discussed and unanimously adopted:

Resolved, That J. W. Tillinghast, Esq., be appointed delegate to represent this district at the annual meeting, to be held at 145 Broadway, New York, Nov. 11th, 1874.

That it is the sense of this meeting that the reserve fund shall be increased to at least ten thousand dollars.

That the delegate from this district be authorized to bring forward such measures and reforms as in his judgment may be for the best interest of the association.

That the expenses of the delegate be defrayed by a per capita assessment on all members of this district. Adjourned.

Activity of Telegraphic Invention.

THE inventive genius of the country has for the past few months been directed to the improvement of telegraphy, particularly toward the improvement and invention of instruments to increase the facilities to cheaper transmission. About four hundred applications have been made for patents of various kinds of inventions in this line. A large number of experts are constantly engaged in experimenting, with a design to increase the rapidity of transmission, register signals by ocean cables, and for various other purposes.—*Washington Chronicle.*

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AND INCLUDING OCT. 26, 1874.

ASSESSMENT No. 69.

- 4, 5, 16, 21, 23, 28, 46, 53, 54, 56, 64, 77, 86, 88, 91, 95, 98, 103, 133, 138, 145, 157, 181, 188, 208, 211, 217, 245, 269, 277, 286, 289, 301, 302, 312, 346, 349, 361, 372, 383, 385, 391, 434, 364, 467, 509, 510, 532, 536, 542, 546, 547, 549, 561, 564, 615, 626, 649, 661, 671, 672, 685, 729, 731, 742, 764, 769, 799, 803, 815, 821, 858, 859, 873, 880, 886, 912, 915, 916, 917, 922, 923, 932, 941, 1013, 1024, 1038, 1039, 1047, 1054, 1126, 1127, 1143, 1147, 1154, 1169, 1175, 1178, 1183, 1189, 1205, 1232, 1252, 1266, 1277, 1282, 1298, 1300, 1304, 1306, 1325, 1345, 1357, 1359, 1371, 1398, 1402, 1403, 1404, 1409, 1410, 1484, 1489, 1516, 1517, 1518, 1550, 1554, 1568, 1571, 1572, 1589, 1708, 1729, 1735, 1745, 1815, 1881, 1894, 1900, 1901, 1907, 1944, 1950, 1951, 1970, 2019, 2021, 2025, 2027, 2030, 2049, 2097, 2103, 2113, 2135, 2138, 2162, 2169, 2174, 2575, 2178, 2181, 2197, 2214, 2228, 2229, 2237, 2238, 2239, 2240, 2241, 2357, 2259, 2263, 2269, 2271, 2272, 2274, 2275, 2276, 2277, 2278, 2280, 2284, 2285, 2286, 2287, 2288, 2290, 2291, 2292, 2293, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311.

ASSESSMENT No. 68.

- 13, 26, 31, 33, 70, 76, 84, 97, 99, 101, 120, 136, 139, 146, 148, 154, 156, 158, 160, 164, 171, 179, 183, 189, 190, 191, 193, 197, 198, 206, 218, 227, 240, 247, 248, 252, 271, 288, 316, 319, 323, 328, 341, 342, 350, 353, 357, 360, 362, 364, 366, 371, 378, 379, 382, 402, 411, 412, 418, 438, 441, 447, 456, 476, 478, 484, 511, 512, 554, 556, 557, 565, 566, 569, 573, 574, 575, 584, 586, 590, 597, 604, 617, 618, 642, 648, 655, 660, 667, 690, 694, 701, 708, 710, 712, 717, 722, 723, 724, 728, 730, 733, 735, 772, 780, 781, 782, 783, 785, 786, 802, 808, 809, 812, 813, 820, 823, 836, 838, 842, 848, 870, 871, 897, 904, 905, 906, 926, 927, 929, 930, 938, 939, 942, 943, 944, 949, 952, 954, 957, 959, 963, 964, 976, 979, 980, 998, 1000, 1002, 1005, 1014, 1016, 1028, 1030, 1031, 1033, 1034, 1041, 1046, 1050, 1057, 1058, 1063, 1069, 1072, 1083, 1093, 1099, 1100, 1101, 1102, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1115, 1117, 1119, 1120, 1122, 1123, 1141, 1152, 1164, 1190, 1191, 1193, 1194, 1198, 1207, 1210, 1211, 1217, 1221, 1234, 1237, 1238, 1240, 1241, 1245, 1251, 1255, 1256, 1267, 1268, 1269, 1270, 1274, 1281, 1283, 1284, 1285, 1286, 1288, 1290, 1292, 1294, 1307, 1309, 1311, 1312, 1313, 1314, 1315, 1317, 1818, 1319, 1320, 1321, 1322, 1339, 1340, 1342, 1344, 1346, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1366, 1372, 1375, 1376, 1405, 1406, 1407, 1415, 1417, 1418, 1421, 1426, 1427, 1428, 1430, 1432, 1433, 1437, 1438, 1448, 1451, 1454, 1455, 1456, 1457, 1459, 1465, 1469, 1471, 1474, 1476, 1481, 1483, 1497, 1498, 1500, 1501, 1503, 1505, 1506, 1507, 1508, 1511, 1513, 1515, 1522, 1524, 1527, 1528, 1529, 1530, 1531, 1537, 1542, 1546, 1558, 1565, 1573, 1576, 1579, 1580, 1586, 1593, 1594, 1596, 1597, 1609, 1616, 1619, 1720, 1623, 1326, 1632, 1649, 1652, 1660, 1661, 1662, 1663, 1665, 1666, 1667, 1673, 1684, 1687, 1688, 1696, 1697, 1698, 1700, 1701, 1702, 1704, 1709, 1710, 1713, 1714, 1718, 1724, 1732, 1733, 1737, 1746, 1747, 1750, 1751, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1765, 1766, 1767, 1769, 1771, 1785, 1788, 1789, 1795, 1796, 1797, 1802, 1804, 1813, 1823, 1824, 1828, 1830, 1837, 1839, 1840, 1841, 1844, 1845, 1857, 1858, 1859, 1860, 1863, 1864, 1876, 1877, 1889, 1895, 1896, 1906, 1916, 1917, 1924, 1931, 1942, 1943, 1953, 1958, 1964, 1969, 1986, 1992, 1993, 1996, 1997, 2004, 2007, 2010, 2012, 2022, 2023, 2026, 2033, 2035, 2041, 2045, 2050, 2053, 2061, 2065, 2069, 2074, 2075, 2084, 2085, 2092, 2108, 2109, 2112, 2120, 2123, 2125, 2128, 2131, 2136, 2142, 2143, 2145, 2147, 2154, 2156, 2159, 2167, 2171, 2180, 2183, 2184, 2185, 2187, 2191, 2192, 2210, 2211,

2216, 2217, 2218, 2220, 2221, 2225, 2226, 2227, 2230, 2231, 2232, 2234, 2235, 2244, 2245, 2246, 2250, 2252, 2254, 2258, 2261, 2266, 2267, 2268.

ASSESSMENT No. 66.

27, 232, 237, 238, 242, 246, 258, 398, 451, 453, 455, 457, 801, 804, 1153, 1275, 1450, 1631, 1715, 1716, 1731, 1786, 1921, 1962, 1974, 1975, 1976, 2037, 2081, 2177.

MISCELLANEOUS.

65.—1650. 67.—25, 1490, 1972, 2114, 2133, 2157, 2168.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice, that an acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Table with columns: OCT., WESTERN UNION, ATL. AND PAC., AMER. DIST., GOLD AND STOCK. Rows for Oct 29, 30, 31 and Nov 2, 3, 4.

New Patents.

For the week ended Sept. 29, 1874, and bearing that date.

156,396.—ELECTRO-MAGNETIC ENGINES.—H. Van Hovenbergh, Elizabeth, N. J. Filed May 27, 1874.

The electro-magnetic motor composed of a four armed armature upon a vertical shaft, that is sustained between the poles of an electro-magnet by the cross bar e between the cores of the magnet, as and for the purposes set forth.

155,499.—ELECTRO-MAGNETIC STOP-COCKS.—Edward Coe and Homer W. Fiske, New Haven, Conn. Filed June 4, 1874.

The arms on the lever E, and projections on wheel A bear such a relation to each other that a full make and break must be had to cause an operative movement of the cock.

The combination of the shaft B, connected to the plug of a cock, the spring D, the toothed wheel A, and the reciprocating bar E, provided with an arm a above and an arm b below the wheel, and armature F, the said arms arranged relatively to each other, and to the teeth of the wheel, as described, so that one arm will come within the circumference of the teeth of the wheel before the other arm leaves it, substantially as specified.

Born.

ANDERSON.—October 25, 1874, to D. S. ANDERSON, of the Western Union Chicago, Ill., day staff, a daughter. First edition, good sounder, regular snapper and rattler combined.

GOODING.—October 27th, 1874, to C. F. GOODING, of the Western Union Chicago, Ill., night force, a daughter. Good-ing nuff.

Married.

ADAMS—DIRSTINE.—At the residence of the bride's mother, Alexander, N. Y., at ten A. M. October 6th, 1874, by the Rev. Dr. Hunt, EDGAR G. T. ADAMS, for many years manager of the W. U. Batavia, N. Y., office, to MISS ELLA A. DIRSTINE.

To Milwaukee, Wis., and return, all beaming with love. Both in luck. One has secured an amiable, beautiful and accomplished lady as a wife, the other has a husband with few vices and many virtues. Bring to mind all that has been said about currents, connections, splices, crosses, etc., matrimonially, and you can imagine just what we would say here: "Long life and happiness."—Ed.

Died.

MINER.—At the residence of his father, New Albany, Indiana, October 15, 1874, of hemorrhage of the lungs, CHARLES T. MINER.

Obituary.

MR. CHARLES T. MINER, whose decease occurred at New Albany, Indiana, on the 15th of October last, was an operator of more than ordinary ability, filling for more than a year with brilliant success the position of manager of perhaps the busiest railroad telegraph office on the Michigan Central Railroad at Jackson, Mich.

A Southerner by birth, our northern climate proved too rigorous for him, and entailed upon him a difficulty of the lungs which only ended with his life. He sought relief and renewal of his lease of life in the far West—his gentlemanly exterior and courteous manner, added to his attainments as an operator, quickly influencing Western superintendents in his favor, so that at once they gave him good offices, such as Colorado Springs and Central City, Colorado, in order to facilitate his pursuit of health. The result was so encouraging that last January he thought himself well enough to return, and so took a position in the despatcher's office at Kalamazoo. A renewal of his disease sent him back to the territories, where he accepted a position in the employ of the Union Pacific R. R. at Laramie, Wyoming, but it was then too late, and realizing that there was no escape he came to his friends in the east, to give them the

comfort of his presence, and to find rest and comfort while abiding the hour when he should seek his heavenly Father's house and face.

He was a man of education, culture and refinement, and evinced much tenderness and mildness of disposition to those who could perceive and appreciate it. In short, he was every thing that is implied in the "grand old name of gentleman." What better tribute can I pay to him? What more could any one have said of us, when of us "there is left but a handful of dust and a memory?" Homer, Michigan.

E. C. DANA.

WATTS & COMPANY,

No. 47 HOLLIDAY STREET,

BALTIMORE, MD.

SUPERIOR TELEGRAPH INSTRUMENTS, RELAYS, SOUNDERS, KEYS, OFFICE WIRE, BATTERIES OF EVERY DESCRIPTION, SWITCHES, GALVANOMETERS, RESISTANCE COILS.

A COMPLETE STOCK of EVERYTHING for the TELEGRAPH OFFICE or ELECTRICAL LABORATORY.

Special attention given to repairing Scientific Instruments. Several of our workmen, having served their time in the most prominent European manufactories, enables us to guarantee satisfaction.

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PHILADELPHIA.

L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of

TELEGRAPHIC AND ELECTRICAL GOODS

of every description, at

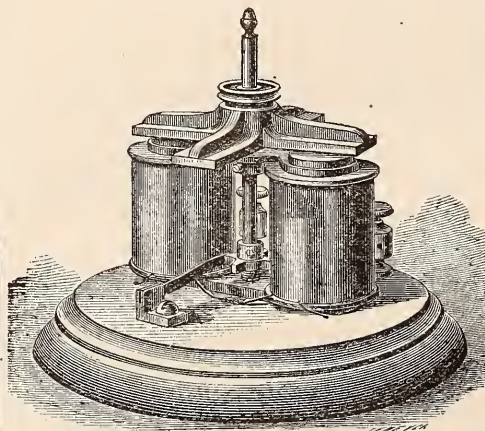
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They solicit the patronage of their friends and the telegraphic fraternity generally.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine

Run by Electricity!

It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery.....\$6 00 " without Battery..... 4 00

May be seen working at the office of the THE TELEGRAPHER.

For sale by

The Electro-Magnetic Manufacturing Company,

36 BROAD STREET, NEW YORK.

P. O. Box 1804.

Also for sale by

L. G. TILLOTSON & CO., 8 Dey street.

F. L. POPE & CO., 38 Vesey street.

OFFICE OF EUGENE F. PHILLIPS,

20 CONDUIT STREET.

PROVIDENCE, R. I.,

September 15, 1874.

GENTLEMEN: I take pleasure in calling your attention to my

PATENT FINISHED INSULATED TELEGRAPH WIRE.

I claim this to be the best braided wire manufactured, and I believe it is universally acknowledged so throughout the country by all the large Telegraph Companies and Telegraph Supply dealers. Its points of superiority are:

- 1st. Its excellence of outside finish. 2d. The toughness of the Patent Compound with which the braid is saturated. 3d. By its polished outside finish, its adaptability for shedding rain and sleet. 4th. On account of the nature of the compound it can be laid directly against any wall or paper without staining or greasing it, which cannot be said of any other paraffine wire.

It is the only braided wire made, which, after it has been up for any lengthtime, will, with ordinary dusting, like any piece of polished furniture, look bright and fresh as when first put up. All other wire, regardless of its color, when first put up, will, in a short time, become dusty and dirt color, making an unsightly thing in an office, where mine, with its brilliant, fresh color, is an ornament.

The toughness of the compound, which also makes it capable of taking this splendid polish, makes it the most durable braided wire made. It is especially desirable for outdoor use, as the rain cannot beat the compound off, and its smooth surface prevents the snow and sleet from sticking to it.

A grease streak along the wall or paper behind the wire running into a nicely fitted up Broker's office, does not make him feel—well, good natured. This can be avoided by using this wire.

I also make it in cables of any number of conductors at the regular price for a single wire.

It is finished in any desirable color or plaids, with a light or heavy insulation, at the following prices:

Table with columns: No., BROWNE & SHARPE'S GAUGE, Price per lb. Rows 8-20.

Finer numbers at special prices.

Galvanized Iron Wire.....\$125 00 per mile. American Compound Wire..... 3 1/2 cents per foot.

Each covered with three heavy linen braids, and well saturated for outside use.

Ten per cent. discount in quantities not less than 10 lbs.

Fifteen per cent. discount in quantities not less than 10 lbs.

A liberal discount for larger orders.

Patented November 18, 1873.

I also manufacture plain cotton or linen covered wire, or will saturate the braid of the same with paraffine, shellac or paint. This may be covered with a wind and braid outside, or two braids, or a single braid, as the customer may wish.

This, if applied, is rubbed smooth on the outside, and I claim and believe is as good as any braided wire made, outside of my Patent Finished.

Table with columns: No., BROWNE & SHARPE'S GAUGE, Price per lb. Rows 8-20.

Finer numbers at special prices. Discount same as on Patent Wires.

I also manufacture a RUBBER COVERED WIRE, which will not grow stiff and crack off in cold weather, or grow soft in the hottest weather.

By my process of putting this rubber on the wire will be found in the exact centre every time. After the rubber is put on it is vulcanized, and then covered on the outside with a braid

and finished, and is suitable for under ground, under water, or any outside or other purposes.

No.	BROWNE & SHARPE'S GAUGE.	Price, per foot
8.	"	\$0 13
9.	"	0 12
10.	"	0 11
11.	"	0 10
12.	"	0 9
13.	"	0 8
14.	"	0 7
15.	"	0 6½
16.	"	0 6¼
17.	"	0 6¼
18.	"	0 6
19.	"	0 5½
20.	"	0 5½

Finer numbers at special prices. Discount same as on Patent Wires.

I have also just put in new and the most approved machinery for the purpose of making Magnet Wires, and feel satisfied that I can furnish as good as any to be had in the market at the following prices:

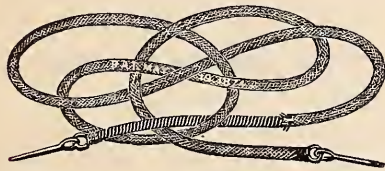
MAGNET WIRES,

BROWNE & SHARPE'S GAUGE,

EITHER PLAIN, PAINTED OR PARAFFINED.

No.	COTTON COVERED.	SILK COVERED.
8.	Price, per lb. \$0 60	
9.	" " 0 60	
10.	" " 0 65	
11.	" " 0 65	
12.	" " 0 70	
13.	" " 0 70	
14.	" " 0 75	
15.	" " 0 75	
16.	" " 0 75	\$1 80
17.	" " 0 80	2 00
18.	" " 0 80	2 10
19.	" " 0 80	2 20
20.	" " 0 85	2 30
21.	" " 0 90	2 40
22.	" " 1 00	2 50
23.	" " 1 10	2 60
24.	" " 1 20	2 70
25.	" " 1 30	2 90
26.	" " 1 40	3 00
27.	" " 1 50	3 20
28.	" " 1 65	3 40
29.	" " 1 90	3 55
30.	" " 2 00	3 70
31.	" " 2 10	3 90
32.	" " 2 20	4 05

Finer numbers at special prices. Discount same as on Patent Wires.



I also manufacture a **PATENT ELECTRIC CORD**, which is pronounced by all to be the most flexible of any in the market, and the best suited of any made for Switch Boards, Medical Batteries, etc.

Silk covered, price per foot.....\$0 06
Cotton or Linen covered, price per foot..... 0 05

Ten per cent. discount on 100 feet. Fifteen per cent. discount on 200 feet.

GENERAL REMARKS.

All wire used by me is made to my special order, and is the best that can be had in the market.

As one of the largest dealers told me a short time ago, "Your wires have come into the market on their merits alone, and we have been forced to keep them," so you may feel sure I shall feel chary of that honor, and shall be very careful to furnish none but the very best in my power.

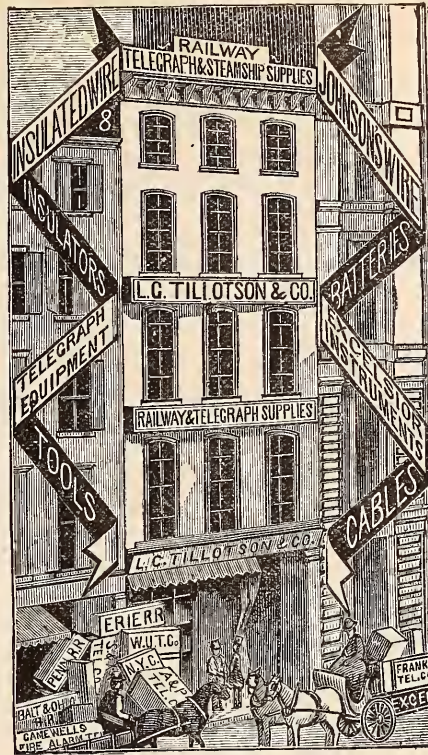
I could give a long list of testimonials, but I will still depend on the "merits" of the wire, and respectfully solicit your patronage.

Your obedient servant,

EUGENE F. PHILLIPS.

These Wires can be had at my prices of

- L. G. TILLOTSON & CO.....New York.
- CHARLES T. CHESTER.....New York.
- F. L. POPE & CO.....New York.
- PARTRICK, BUNNELL & CO.....New York.
- PARTRICK, BUNNELL & CO.....Philadelphia.
- CHARLES WILLIAMS, Jr.....Boston.
- THOMAS HALL.....Boston.
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They have the **GREATEST VARIETY.**
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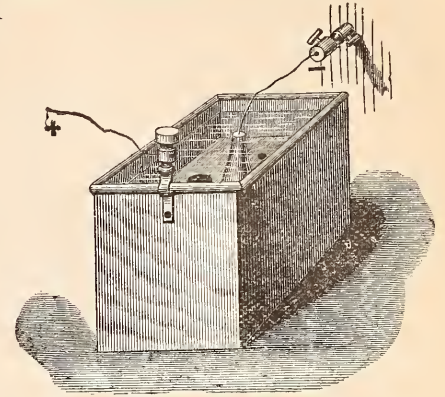
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Comprising Sounder and Key, is the greatest
success of the times.

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We are offering 20 per cent discount from list prices on all instruments of our manufacture.
L. G. TILLOTSON & CO.,
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A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.
PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

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COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the **COMPOUND TELEGRAPH WIRE** compared with Iron, consists in its **LIGHTNESS** relative **TENSILE STRENGTH**, **CONDUCTIVITY** **DURABILITY**, **EFFICIENCY** and **RELIABILITY.**

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J. R. DOWELL, Richmond, Va., Special Agent for Virginia and North Carolina.

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THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y., Alleghany, Pa., Boston, Mass., Bridgeport, Conn., Buffalo, N. Y., Baltimore, Md., Chicago, Ill., Cincinnati, Ohio, Columbus, Ohio, Cambridge, Mass., Charlestown, Mass., Covington, Ky., Detroit, Mich., Dayton, Ohio, Elizabeth, N. J., Fall River, Mass., Fitchburg, Mass., Hartford, Conn., Indianapolis, Ind., Jersey City, N. J., Louisville, Ky., Lowell, Mass., Lawrence, Mass., Lynn, Mass., Mobile, Ala., Montreal, Canada, Milwaukee, Wis.,

New York City, New Orleans, La., New Bedford, Mass., New Haven, Conn., Newark, N. J., Omaha, Neb., Philadelphia, Pa., Pittsburg, Pa., Portland, Maine, Peoria, Ill., Providence, R. I., Quebec, L. C., Rochester, N. Y., Richmond, Va., St. Louis, Mo., St. John, N. B., Springfield, Mass., San Francisco, Cal., Savannah, Ga., Syracuse, N. Y., Troy, N. Y., Taunton, Mass., Toledo, Ohio, Toronto, Canada, Washington, D. C., Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The Automatic Repeater, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

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Third—The Electro-Mechanical Bell Strikers, adapted to produce the full tone of the largest church or tower bells.

Fourth—The Electro-Mechanical Gong Striker, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only PERFECT, COMPLETE and RELIABLE System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original FARMER & CHANNING PATENTS, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, THREE CAN BE NO QUESTION.

The cooperation of TELEGRAPHERS in securing its introduction into their localities is cordially invited, and their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

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KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

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We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES,

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

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This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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is the most popular brand in the market. This wire is offered on its merits alone. We have never failed to secure the order when placed in competition with other prominent brands. Invoices guaranteed equal to sample, which will be promptly forwarded on application.

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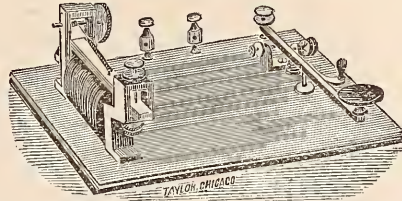
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A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

VOL. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ersted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

VOL. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

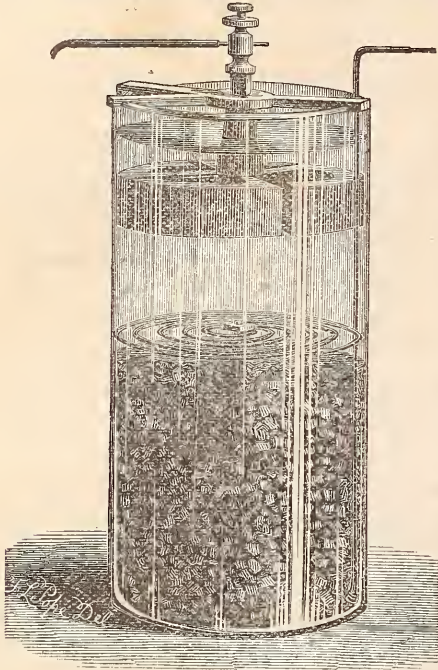
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



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LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be

FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
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LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

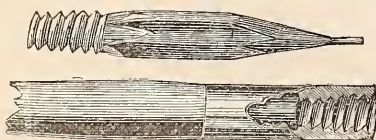
The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
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L. G. TILLOTSON & CO.
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SOLE AGENTS.

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W. H. SAWYER, Secretary.

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"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

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Price per doz., \$1.50.

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41 Third ave., Chicago, Ill.

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No. 220 KINZIE STREET, CHICAGO.

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Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

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Five years' operation have proved its merits.

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HAMBLET'S ELECTRO-MAGNETIC WATCH CLOCKS AND TIME DIALS.

Western Electric M'f'g Co., Chicago.

TELEGRAPH WIRE, Numbers 8, 9 and 12.

UNION BRAND, AND

UNION BRAND EXTRA QUALITY.

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BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

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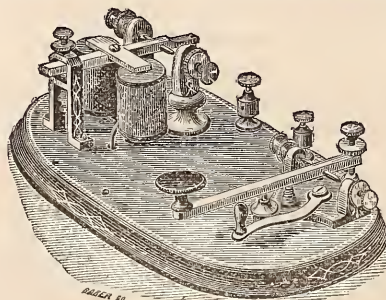
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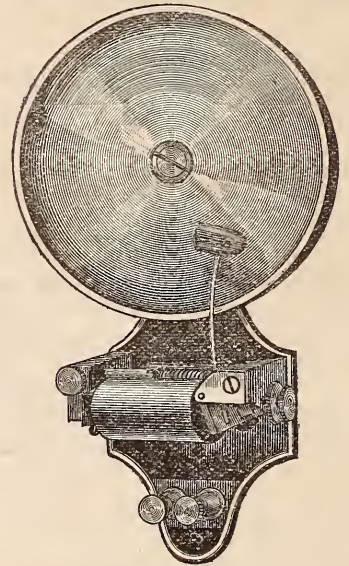
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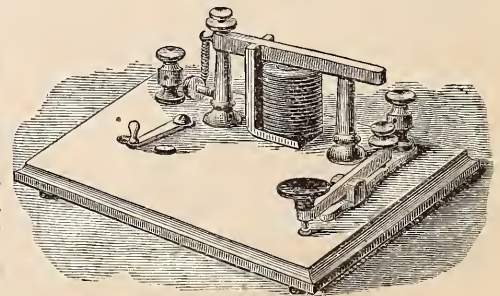
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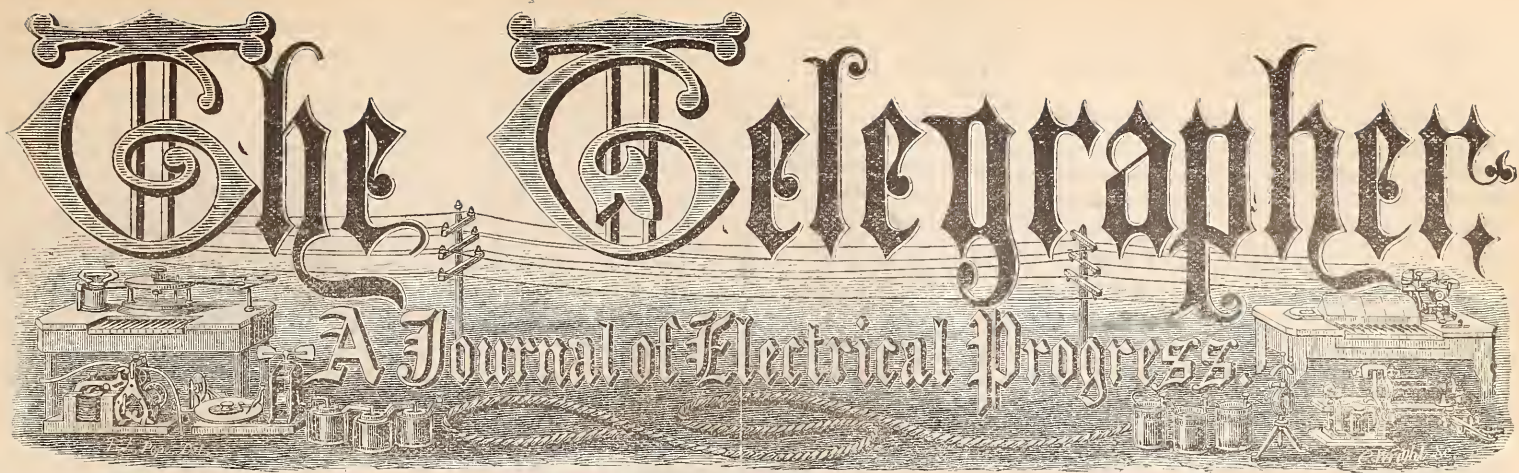
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The Telegrapher

A Journal of Electrical Progress



Vol. X. New York, Saturday, November 14, 1874. Whole No. 435

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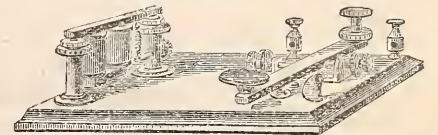
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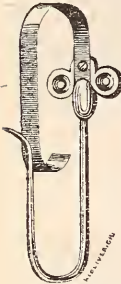
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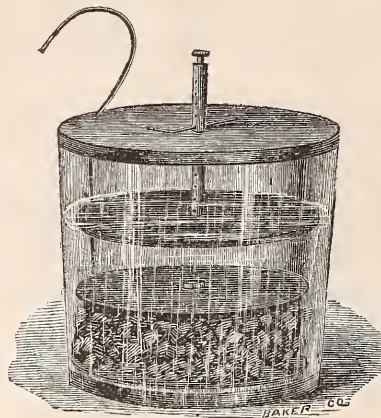
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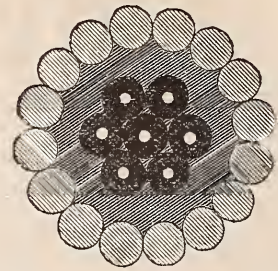
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, NOVEMBER 14, 1874.

VOL. X.

WHOLE No. 435.

Original Articles.

A Cry from Macedonia.

BY OWTON A FLYE.

WHERE is the immortal Nibbs?

He came to us when the first robin warbled its notes in the ethereal mildness of a springtime long ago. Nobody shuddered at the awful immensity of his avoirdupois, because from out the polished dome which surmounted it all there beamed two lustrous orbs, giving evidence of a soul within whose dimensions were in delicious accordance with the whole.

Nobody lost faith because the subject of this paper never had any tobacco, inasmuch as all his propositions came to us, burdened with such an air of patronage that they seemed sufficient in themselves to fill our waiting hearts to overflowing, and even to bubble over, and out, and around, filling as it were, eternal and incomprehensible space.

Nobody smiled derisively, sardonically or otherwise, when the person who is the burden of my song to day opened his key to the tune of once in every five words, because the manner in which it was performed and the object sought to be obtained bore upon their very faces the essential elements of plausibility to such an extent that our doubting hearts were converted to his method on the spot.

Nobody drifted on to the ragged edge of remorse when it became known that he for whom we mourn to-day gave no symptom of unimpeachable veracity. We realized then for the first time how easy it was to lie, and, heaven save the mark, how easy it was to listen. Whether modesty had grown up in him to be part and parcel of his being, or whether the intents and purposes of his life were directed against our susceptibilities, we can never know; but the fact remains that he never presented the truth to us in its nakedness, but always brought it decked out in the glitter and glare of perversion and doubt, and our souls adapted themselves to the occasion, and believed. This demonstrates clearly enough that, of all things, lying is the easiest, except—believing. Debtor and creditor were never nearer, and, perhaps, dearer to each other than the weary, toiling and aspiring art nimbles of that day were to this new departure—if the expression may be allowed—of our lives.

But a shadow came—the first great overwhelming disaster of our times. A principle was to be confirmed or abandoned. It was the strike of '70. Our hero, true to conscience, or necessity, went with us, and oh! shades of Gilligs! the principle was lost, and so was our idol; gone from us, it may be, forever!

Speaking for myself, I can never forget how he appeared to me as the first and only distinct embodiment of my ideal of Scipio at Carthage.

However, there's a fragrant air of memory about these musty walls; we have many mementoes of his virtues still left to us; we cling tenderly and tenaciously to every token of his whilom glory, yet we all cry out in the agony of our souls, where, O! where is his Nibbs?

Duplex, Quadruplex and Fast Telegraphy.

THE following extracts from a communication of Mr. D. H. Craig, in a recent number of *The Graphic*, will be of interest. It will be noticed that he intimates that the "Quadruplex," even if successful, is not available to the Western Union Telegraph Company:

In President Orton's recent annual address to the shareholders of the Western Union Telegraph Company much stress is laid upon the "Duplex" and high hopes placed upon the "Quadruplex" systems of telegraphing. Those systems are doubtless improvements upon the Morse system in the number of words which can be transmitted over a single wire in a given time in fair weather, but the claim of the inventors and their friends that the capacity of the wires of the Western Union Company can be doubled by the "Duplex" or quadrupled by the "Quadruplex" system may answer very well to bolster up the stock of the "monster" company amongst the speculators in Broad street and the curbstone philosophers in New street, but there is

not a practical operator who values truth in the employ of the company who will say that 1,500 words per hour can be averaged, one hour and one day with another, by "Duplex," nor that 2,500 words can be averaged by the "Quadruplex." If the same operators had independent wires, the first four would prefer to send 2,000 words (instead of 1,500 by "Duplex"), and the eight operators would prefer to send 4,000 words instead of 2,500 by "Quadruplex"), one hour and one day with another. A moment's consideration, therefore, will show the utter fallacy of the claim of the President and Electrician of the Western Union Company, either that the capacity of their wires can be doubled or that the business of telegraphing can be at all cheapened by the "Duplex" or quadrupled or "cheapened" by the "Quadruplex." So far are these statements from being correct that it is quite within the truth to say (and the practical telegraphers of the Western Union Company will confirm my statement) that it would cost the company at least twenty per cent. more—labor and wires included—to do their business by the "Duplex" than it would by the Morse system, and it would cost at least twenty-five to thirty per cent. more to do the business by the "Quadruplex" than it would by the "Morse." As I have a large and direct interest through the Automatic Telegraph Company (who own all the so-called inventions of Edison in the too much commended "Quadruplex" system), my judgment is not likely to err on the wrong side. I may also say that no one having authority has ever proposed to give the Western Union Company permission to use the "Quadruplex" system; and it is difficult to imagine what purpose Mr. Orton had in his extravagant allusions to it, unless it was to lead support to some of his "lameduck" friends in Broad and New streets.

The well affected enthusiasm of the managers of the Western Union Company in favor of "Duplex" and "Quadruplex" telegraphy is by many supposed to be for the purpose of hiding their ignorance and brazen effrontery in 1869-'70 in denouncing my "Automatic" or "Fast" telegraphy. At that time the President and Electrician of the Western Union Company insisted that there was no system of telegraphy equal to Morse (and this in the face of the fact that "Duplex" telegraphy was then thoroughly established upon the Franklin Boston line), and that my Automatic system was utterly valueless, because, as they said, it could not be worked at a faster speed than about sixty or seventy words per minute in a circuit of 250 miles, whilst the fact is that over 1,000 words per minute have been and can at any moment be transmitted by that identical Automatic system over 300 miles of wire. Those gentlemen are too proud, or too conceited, or both, to acknowledge their error, and they have been raising a furious dust ever since, first about one trumpet blowing or another, like "Duplex," "Wheatstone's Automatic," and now about "Quadruplex" telegraphy, and all the time, in place and out of place, through thousands of addresses, reports and "official journals," and through their legions of subservient tools all over the country, a steady stream of misrepresentation has been carried on against my system of Automatic telegraphy. The effect has been thus far, coupled with the ridiculous mismanagement of the Automatic Telegraph Company, to deter capital from taking up the "Fast" or "Automatic" system, and Mr. Orton complacently points to the fact that the Automatic Company has done nothing since 1870-'71, as evidence that his original statements were true, and that the "Fast" system is of no account in comparison with his second-hand pet "Duplex."

[From *The Telegraphic Journal*.]

The Telegraphs of the Argentine Republic.

NOTHING impresses one more with the progress of telegraphy than the growth which it has acquired, and the rapid advances which it has made in countries where, until within the last few years, it was altogether unknown, and where the establishment of a telegraph system was till then a subject not even dreamt of.

The official report of the telegraphs of the Argentine Republic by the Director-General, Mr. Charles Burton, has just reached us.

The Government telegraph system dates from the year 1870. In that year 129 miles of line were erected, and this has year by year gone on increasing until it now reaches 2,618 miles of line, carrying a total mileage of wire of 5,218 miles. Siemens's iron posts are employed on 1,448 miles; wooden poles of the country, in their natural state, have been made use of on the remaining 1,170 miles. In addition, however, to this, there are various private undertakings, which have either been "subventioned" by the National Government, or belonging to the various railway companies in the State. These, including a two wire line of 32 miles (belonging to the River Plate Telegraph Company), have 1,523 miles of line, carrying 2,841 miles of wire, which, added to the purely national telegraphs,

give a grand total for the Argentine Republic of 4,146 miles of line, and 8,059 miles of wire.

These lines have been erected by private contractors, at a cost ranging from 500 "hard" dollars per mile for lines with iron posts, to 384 "hard" dollars per mile for those with wooden poles.

The national lines are maintained by the Government with a staff at present of one director-general, one mechanic, three inspectors, six "line repairers," and fifty-seven linemen. The latter seem to be but poorly paid; their actual salary is forty hard dollars per month, "with which (we quote the words of the report) they have to buy and maintain a sufficient number of horses, pay their extra expenses when they are out, besides rent and ordinary cost of living at the point where the office is situated, and where they must fix their residence."

Mr. Burton on this subject pertinently remarks, "It is false economy to allow a practical lineman accustomed to the specialties of his section, and acquainted with the nature of the ground in which it is situated, to leave the service, instead of giving him a salary with which he could satisfy the ordinary necessities of life."

The Morse instrument is universally employed throughout, and the alphabetical signs are those adopted by the European International Convention, with the exception that — — — is used for ll, a combination of frequent occurrence in all the dialects of the Spanish language.

The instrument is not, however, equal to the pressure which from time to time suddenly arises on the trunk lines, and some other system must be introduced to augment the rate of working of the ordinary Morse. The only instrument which has hitherto been tried in addition to the Morse is the Hughes, which, as one would naturally expect, has failed to accomplish the end in view. Without special instruction in its management, and perfect familiarity with all the mechanical details, Hughes's apparatus cannot be considered in any way superior to the Morse for the despatch of traffic. Mr. Burton accordingly urges upon the Government the necessity which exists for his proceeding either to England or the United States, and personally inspecting the improvements which have been made in the transmitting apparatus of these countries during the last five years. We doubt not that the wants which are felt could easily be satisfied. The introduction of duplex working, or the establishment of an automatic system on the trunk lines, would, we are sure, do all that for several years to come could possibly be required of them.

There are in all sixty offices, which are manned by a staff of 114 telegraphers (including clerks in charge), five counter clerks, and sixty-seven messengers. At the great majority of these only one instrument is fixed. Rosario can boast of seven. They are kept open to the public up to 4.30 P. M., although telegrams proceeding from other lines, or from the press, are received up to 7 P. M. Government telegrams are of course received at any hour when there are clerks at the offices.

The qualifications for the appointments of telegraphers are good penmanship and a perfect knowledge of orthography. The minimum age at which they are admitted—eighteen years—might with advantage be reduced; the mechanical art of telegraphing does not require the mental powers to be matured; a healthy lad commencing at, say, from fourteen to sixteen, will, when he has reached the age of eighteen, be found, if at any period of his career, an expert manipulator.

We are glad to observe that, as in the postal telegraph department of England, an outlet is afforded in this direction for the employment of female labor. The first female telegrapher, we read, was appointed to the service on January 1, 1873, but since then no addition to the number has been made. This, however, must not be attributed to any idea as to the inaptitude of female labor for telegraphy; Mr. Burton is, on the contrary, convinced that the reverse is the case; yet, although several competent clerks have presented themselves, the difficulty of procuring vacancies in the towns where the necessary conveniences and security could be found, has prevented them from receiving appointments. The telegraphers appear to have been at first trained in the large offices, but the practice has been discontinued at the two largest—Rosario and Panama—"on account of the many errors which were incurred in the retransmission of telegrams being chiefly committed by learners who were not sufficiently competent." They are now educated either at the school of instruction which has been instituted at Buenos Ayres, or they are placed at one of the minor stations in the interior.

A uniform tariff is adopted betwixt all the National Telegraph offices, and is at present 25 cents (about 1s. 0½d.) for every ten words, not including the address,

* The hard dollar (peso fuerte) is worth about 4s. 2d., and should not be confounded with the paper dollar (moneda corriente) which is only worth 2d. The former is always used in national and the latter in provincial accounts.

and signature, which are sent free; each figure is counted as a word. For press messages 25 cents are charged for the first twenty-five words, and 1 cent for each succeeding word. It is now proposed to abandon this tariff, and adopt in its place the system of the International Convention. Should this be carried out the minimum charge will then be 40 cents (about 1s. 8d.) for any number of words up to twenty, including the addresses and signature; 20 cents for every succeeding ten words; each group of figures up to five to be considered as one word.

During the first three years—1870, 1871, and 1872—the traffic went on rapidly increasing; but in 1873 there was a marked decrease in the number of messages, although the actual value was considerably over that of those dealt with in 1872.

The following returns show the progress of the telegraphs from the commencement:—

Year.	No. of Telegrams.	Value in Hard Dollars.	Total Cost of Maintenance.
1870	6,440	1,511.05	14,532
1871	61,429	21,490.78	81,361
1872	181,773	78,560.67	111,243
1873	170,823	81,827.80	193,870

This falling off is accounted for, first, by the destruction of the telegraph lines through inundations in the Northern provinces; and secondly, by the Rebellion which broke out in the beginning of May in the province of Entre Rios, and continued until the close of the year. The natural consequence was, that although the number and value of private messages decreased, yet those sent upon Government business were considerably in excess of the previous year. The following comparison of private telegrams with official during the years 1872 and 1873 is interesting:

Year.		Value in Hard Dollars.
1872.	Private.....	166,802
	Official.....	14,971
1873.	Private.....	150,424
	Official.....	20,399

From the figures which are published above it will be seen that the receipts from private telegrams by no means cover the expense of maintaining the service, and this it is which has mainly led to the contemplated revision of the tariff already alluded to.

An interesting section of the Report is occupied with a narrative of the difficulties which the Staff had to contend with during the year 1873; the Rebellion in Entre Rios "left behind it about 700 miles of line in the most deplorable condition." During the war, also, large sections of the wire were stolen, on account of its intrinsic value, by the neighbors to the line, and used for fences or other domestic purposes.

Great difficulty was experienced frequently in securing the delivery of telegrams to the National army. In one town, occupied by the rebels, a clerk resided in the telegraph office, and the other employes being prohibited entrance, a lady—who was made aware of the circumstances—entered the office, and, by secreting the telegrams in her dress, succeeded in delivering them.

The working of the lines is frequently interrupted by faults, in many instances ingeniously devised, evidently by those acquainted with the science, in others apparently prompted by pure mischief. Upon one occasion, for instance, "a wire was totally disconnected betwixt Rosario and Cordoba. The linemen examined the section several times without succeeding in detecting the fault, until finally it was discovered that a portion of the wire had been cut out and replaced by a curtain cord of the same gauge, and painted so as to resemble in appearance, as closely as possible, the line wire. Guitar strings are frequently placed so as to connect the wires with the iron posts, at points where they can with difficulty be seen from the road. In one instance one of these guitar strings had been employed to bring two wires, running upon the same line of poles, into contact with each other, and was then covered over with a piece of raw hide in such a manner that the linemen, knowing that the hide alone could not cause the fault, passed and re-passed the place without suspecting what was wrong."

The assistance which the telegraphs of the Argentine Republic have rendered to the Government can not well be overestimated. Their value in stamping out rebellions, and preventing the needless effusion of blood, is acknowledged, and one may be permitted to indulge the hope that, when the enormous power which they wield comes to be more generally recognized, they will prove a still more valuable ally to the cause of order, and become one of the most powerful agents in effectually putting an end to the anarchy to which this vast and rich country has been so long a prey.

The number of messages passing over the Cuba Submarine Telegraph Company's line during the first fortnight of September was 916, estimated to produce £1,000, against 641 messages producing £650, for the corresponding period last year.

The Fire Alarm Telegraph on the Central Pacific Railroad.

A CORRESPONDENT of the *Railroad Gazette* sends to that paper the following interesting account of the introduction of Gamewell & Co.'s system of fire alarm telegraphs for the protection of the snow sheds on the Central Pacific Railroad:

FIRE ALARM TELEGRAPHS ON RAILROADS.

You will notice from the inclosed circular that the Central Pacific Railroad has adopted the fire alarm telegraph in the snow sheds of the company over the Sierra Nevada Mountains, which strikes me as a wise precaution, and worthy of imitation under similar circumstances. The idea (so far as I know) is a new one, and perhaps a publication of the circular might lead to its useful employment for the protection of bridges and wood piles on other roads. Thousands of dollars might have been saved last fall and spring on roads in this section if a small gang of men could have been dispatched to the burning wood piles before the fire reached a point beyond control. Fires in the great woods of this region travel fast, and assume immense proportions in a very short time, so that a single watchman at a wood pile is almost powerless to avert the flames, and he must wait for some approaching train, which may not be due for several hours, or walk to the nearest station, before he can give the alarm. The fire alarm would (it seems to me) in such cases be a useful and economical thing.

[The following is the circular of Mr. A. N. Towns, General Superintendent of the Central Pacific, to which our correspondent refers above. It was issued September 1:]

NOTICE TO EMPLOYEES.

"For a more thorough protection against fire in the snow sheds and galleries between Blue Canon and Truckee, the company has introduced the fire alarm telegraph system for use in connection with the fire trains at Blue Canon, Emigrant Gap, Summit and Truckee, at which places large electrical gongs are located. There are also 26 signal stations or boxes, varying in distance and placed in convenient situations, according to local circumstances. The locations of the boxes are indicated by small sign boards marked 'Signal Box.'

The following rules and regulations must be strictly observed by all:

"Agents, train men and track men must be provided with switch keys (which will unlock the boxes), and, upon the discovery of a fire in the snow sheds, galleries, bridges or buildings, unlock the signal box, *pull down the hook*, let go and then *listen*. If you hear a little bell strike inside the box, you may be sure the alarm has been correctly sent in. Should you fail to hear the bell strike, go to the next nearest box and try that. Should you again fail to hear the bell, proceed with despatch to the nearest telegraph office and give the alarm.

"If, on approaching a box, you hear the little bell strike, you may know that the alarm is being sent from some other box, and no action on your part is necessary. Pulling down the hook in one of the boxes will sound the signal on the large gong at the fire stations, and will also sound the little bell in all the other stations or boxes.

"Each signal box, on being started, will give its number four times—a pause intervening between each repetition. These signals are announced through a repeater on the Morse Telegraph Circuit by a repetition of the word 'Fire,' each time that it appears, being counted in the same manner as the blows on the gong.

"The signals as received on the gongs will be counted as follows, viz., from box No. 3, three consecutive blows, one, two, three; box No. 12, one blow, pause, then two blows in succession; box No. 23, two blows, pause, then three blows in succession; and so on, the pause being a space of time equal to three blows in succession. Nos. 1, 10, 11, 20, 22 and 30 are omitted.

"Agents at Blue Canon, Emigrant Gap, Summit and Truckee are required to see that the gongs at their respective stations are kept properly wound up, and at all times in readiness for the reception of an alarm.

"TESTING SIGNAL.—One blow will be struck upon each gong in the system immediately after 'taking the time' at twelve o'clock noon. Those in charge of fire stations will promptly report any failure to receive the signal. When received it signifies *all in working order*. At any other time, or on hearing the irregular striking of the gongs, it signifies that it may be occasioned by atmospheric electricity, defective or broken wires, or some other cause requiring the attention of the foreman of telegraph repairs having the fire alarm system in charge.

"CAUTION.—Avoid all tampering with the gongs or boxes; avoid, if possible, giving signals for a fire seen at such a distance as to leave any uncertainty as to its location.

"Those in charge of fire trains should approach the

station or box from which the alarm is sent with great caution, keeping full control of the train on the grade.

"When the signal for the fire alarm circuit is turned upon the division wire through the repeater, all operators on the division wire will immediately close their keys and await orders from the Train Despatcher at Sacramento. Should he fail to hear the alarm, and there should be no response from that office, then the operator on duty at either of the fire stations will call "H" office (Sacramento) on one of the other wires, using signal No. 9."

Then follows a list of fire alarm boxes or stations, with their locations.

In this connection the following account of the "fire trains" on the Central Pacific, given by a California paper, will be found interesting:

"The Central Pacific Railroad Company employ no less than four fire trains on the mountain route across the Sierra. The first is stationed at Blue Canon, the second at Emigrant Gap, third at the Summit, and the fourth at Truckee. Each train consists of a locomotive and three or four water cars. These cars are about the same length as an ordinary freight car, and formed of two-inch plank; they are strongly put together, as nearly water-tight as possible, and are elevated above the track about four feet. Each car will hold 3,000 gallons of water, or not far from 100 barrels—equal in weight to 24,000 pounds. The locomotives are arranged with powerful pumps that throw a steady stream, and do equally as good work as the best steam fire engines used in any of the large cities. Leather hose three inches in diameter is used, which, when not in use, is wound upon a large reel mounted on one car of each train. These trains are kept in constant readiness to proceed with all possible speed to the locality of the fire upon the first alarm. All of the 25 miles of shedding between Emigrant Gap and Truckee is thoroughly deluged with water once a week. In sprinkling the sheds the pipe man stands on the pilot in front of the engine, which moves slowly along at the rate of two miles an hour. In this work five men are sufficient to manage a train. Since the introduction of the fire alarm telegraph, with 32 different stations between Emigrant Gap and Truckee, the danger of any very disastrous conflagration in the sheds is nearly or quite obviated.

Telegraphic Cables.

It is evident that a new invention, in connection with the manufacturing of telegraph cables, is needed, and a good opportunity for the exercise of ingenuity in this line now exists. *Engineering* says that portions of a cable laid in 1860, between France and Algiers, were dredged up in 1871 in 400 fathoms off Minorca, and the outer covering of steel and hemp, similar to the Atlantic cable, found to be completely destroyed, so that the piece would only bear a few fathoms of its own weight. This was on a soft, muddy bottom. The Falmouth and Gibraltar, laid in 1870 and repaired this year, was found chafed through at a depth of 1,000 fathoms. The Direct Spanish cable failed suddenly in the Bay of Biscay, and was found for a mile to be swallowed up in the ground at a depth of 1,300 fathoms, as if by volcanic action, the bottom being stiff blue clay.

If there is any part of the Atlantic crossed by the Atlantic cables having the same species of bottom as that where the Algiers cable of 1860 was dredged up, there would be a certainty of the cable decaying to such an extent that, if lying also over a ridge, it would eventually break. Nor does it seem so entirely improbable that volcanic action or movements of the ground, similar to that which undoubtedly occurred in the Bay of Biscay and also in the Persian Gulf, may occur on some portions of the route. The question of the *teredo*, also arises. Cables in the Mediterranean have been found attacked by these insects at great depths; but in these cases, probably from the cables thus examined not having been submerged long enough, the boring was only slightly into the surface. In shallow water, cables have been found with holes bored through the gutta percha down to the copper wire, thus entirely destroying the insulation.

Thus, a piece of cable laid in Kurrachee harbor was found bored down to the copper, the insect having got in in places where the outer protecting wires were a little open; more recently, too, the cables in the Irish Channel have been found attacked. Two wires in the Dublin and Holyhead cable, laid in 1871, have just been found thus injured, and are rendered useless. This cable has each of its outer sheathing wires covered with a coating of tape, and thus the actual iron wires do not touch each other, so that the insect is able to pass between them. The Atlantic pattern of cable is still more open to the attack of the insect, as the outer steel wires, being each covered with a thick coating of Manila hemp, are separated from one another by more than their own diameter. We have no experience yet of this insect having attacked an Atlantic cable; and should this ever occur, the pattern of all future At-

lantic cables will have to be entirely revised. The pattern of the cables used on the principal lines in the Mediterranean and on the Direct Spanish, where the steel wires touch each other, would be a much safer one in localities where the attacks of this insect are to be feared.

But should the danger be found to extend to the Atlantic, it is doubtful whether the insulation of such important lines should depend even on the certainty of the outer wires touching one another throughout. In the case of the Wexford cable, where the outer covering consisted of iron wires, supposed to touch throughout, the insect has found out places where they are a little open, and has thus been enabled to insinuate itself, destroying the insulation by boring through the gutta percha. It is evident that, in these localities at least, a more certain protector than the iron wire is required. Some four years ago Mr. F. C. Webb devised the application of a thin steel armor to the insulated wire, but it has never yet received any practical application. Something of this sort must, however, be adopted wherever the attacks of the *teredo* have to be resisted.

Improvements in Military Telegraphy.

THE *Journal Télégraphique* describes the system recently patented by M. Lemasson in France. Its chief feature is the capability of being rapidly set up, an all-important requirement for military telegraphy. The posts are each made in two or three sections, fitting into one another, thereby allowing them to be reduced to a half or a third their greatest height. The lowest section, in order to facilitate erection, is provided at its extremity with a steel point; the upper section is furnished with ebonite insulators, which screw on to the ends of the posts. Steel fastening collars, or rings, fitted with screws to press and contract the collars, bind together the sections and permit the height to be regulated according to the exigencies of the service. On a march the posts may be taken to pieces, and, therefore, more easily handled than is the case otherwise, especially when, as in steep and rugged roads, they have to be transported on the backs of mules. The construction of a line on ground open to fire can be carried out at the height of a man without need of ladders or exposure of men. Once so constructed, it is simply necessary to raise by hand the different sections, and fix them to the lower sections by means of the steel collars at the desired elevation. Similarly in the case of breakage the broken portions can be easily lowered and repaired. Experiments on different grounds prove that by this system lines can be erected at the rate of two kilometres the hour, or quick enough to follow the movements of a *corps d'armée*.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AND INCLUDING NOV. 7, 1874.

ASSESSMENT No. 69.

- 13, 52, 59, 61, 65, 67, 72, 80, 89, 90, 93, 121, 122, 129, 131, 134, 140, 215, 220, 235, 244, 247, 254, 257, 267, 278, 279, 280, 282, 283, 285, 351, 367, 380, 381, 406, 414, 416, 425, 426, 463, 526, 533, 548, 553, 554, 576, 577, 579, 587, 594, 600, 603, 678, 680, 703, 714, 715, 721, 735, 740, 791, 825, 830, 832, 876, 952, 978, 995, 998, 1001, 1023, 1055, 1074, 1076, 1081, 1088, 1090, 1093, 1144, 1148, 1167, 1173, 1182, 1200, 1248, 1259, 1260, 1267, 1292, 1329, 1364, 1365, 1368, 1394, 1425, 1431, 1453, 1470, 1482, 1532, 1560, 1564, 1590, 1601, 1615, 1619, 1625, 1626, 1630, 1632, 1634, 1635, 1692, 1695, 1728, 1809, 1811, 1812, 1817, 1831, 1869, 1874, 1911, 1913, 1914, 1965, 1999, 2000, 2001, 2028, 2029, 2036, 2038, 2048, 2057, 2082, 2118, 2192, 2194, 2195, 2199, 2203, 2204, 2205, 2206, 2213, 2216, 2223, 2224, 2262, 2302.

ASSESSMENT No. 68.

- 22, 273, 294, 347, 481, 482, 527, 692, 725, 766, 869, 899, 908, 920, 1134, 1135, 1136, 1485, 1559, 1605, 1610, 1611, 1612, 1639, 1653, 1655, 1657, 1690, 1691, 1722, 1778, 1827, 1978, 1995, 2063, 2066, 2182, 2200, 2265.

MISCELLANEOUS.

- 67.—883.
- 66.—19, 1502.

Members of the Association who look to THE TELEGRAPHER for receipt of the assessments paid, will please take notice, that an acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

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WANTED—A line to fill out this column.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Cable Telegraphy.

TO THE EDITOR OF THE TELEGRAPHER.

In an issue of the *Scientific American*, under date November 7, 1874, appears a communication from one T. A. Edison, Newark, N. J., referring to a paper read before the British Association by W. H. Winter, on an improvement in cable telegraphy.

T. A. E. says that the principle shown was invented by himself, and patented both in England and in this country some three years ago, and that it is used by the Automatic Telegraph Company.

Permit me as the consulting electrician of that company, and as owner of all of the electro-chemical automatic telegraph patents used by said company, to deny in toto the above assertion; and to show how the case really stands, in order that T. A. E. may, as well as other parties, "know how it is himself."

In the first place, the party referred to, W. K. Winter, does not claim any improvement in automatic telegraphy, but simply an improved method of operating a "Galvanometer," or other receiving instrument, by means of the induction coil and earth contact, wherein he uses the primary and secondary wires of an induction coil as a "balance," or Wheatstone bridge, whereby the increase of the current through the primary wire not only induces a current in the secondary wire, but causes a self-induced current to "flow," being, in fact, an equivalent to a "condenser" with a shunt helice. Mr. Winter's patent bears date December 6, 1872.

In the second place, T. A. E. professes to claim in an English patent under date April 25, 1873, one or more electro-magnets in the shunt circuit, to neutralize the attenuations of the pulsations in the main line circuit, and bring the line to a normal condition to prevent tailing upon the chemical paper of a chemical telegraph, in fact, an equivalent for a "condenser" with a shunt helice.

In the third place, I claim, under patents of dates October 18, 1870; August 29, 1871; April 9, 1872; April 22, 1872; September 10, 1872; September 2, 1873, the use of electro-magnet rheostats, rheostat overflow dams, condensers with shunt helices or accumulators *per se*, in shunt or branch circuits, in combination with an electro-chemical automatic telegraph, to bring the line to a normal condition, prevent tailings, and to produce rapid work.

GEORGE LITTLE, C. E.,

Passaic City, N. J., U. S. A.

Paterson, N. J., Operators.

IN THE WILDS OF JERSEY, }
October 9th. }

TO THE EDITOR OF THE TELEGRAPHER.

OUR next Paterson operator on the list is Mr. C. H. Christie, "C," a retired Erie operator. He is ticket agent in the same office with Dougherty, his (C's) hours are from six A. M. to two P. M.

Among the operators who work in New York and live in Paterson are the following:

First on the list is Mr. Reeve Westcott, "R. E.," who works at Long Dock, Jersey City. Reeve learned from his brother at the Western Union office here, then went to 145 Broadway, N. Y., afterwards on the Erie as operator, then ticket agent at the depot in this city, from which place he left to go to Long Dock. He is a first class fellow.

Next comes Mr. John Hayes, "H.," who works at Pier 8, East River, 23 South street, N. Y., for the Western Union Telegraph Company.

Next is Mr. Monroe Labourg, "R.," who works at 145 Broadway, N. Y., for the Western Union Telegraph Company. He is one of the boys. "R." was married about the first of October, and goes to housekeeping in a few days, on the east side, near Broadway and Twenty-fifth street, Paterson.

Last, but not least, is Mr. Will McGill, "W. M.," who works in "P. R." office of the Western Union, on the dock, near Twenty-third street depot, of the Erie railroad.

These four all come up every night and go down every morning, and from what I hear they have it quite easy.

We will now leave the Erie for a short time and walk over to the D. L. and W. depot, which is almost out of town, where we find Mr. S. J. Tinsman, "S. M.," to whom we are much obliged for information in regard to D. L. and W. (Boonton Branch) operators. Mr. T. is a rather tall, pleasant looking gentleman; he is both ticket agent and operator.

Mr. Morris Bixby, "B.," and his brother, Eddie, are

old timers from the D. L. and W. Are not at work at present, but can be seen at this depot once in a while. Their father is secretary and treasurer of the Danforth Locomotive Works of this city.

At West Paterson, on D. L. and W., during the day, we find Mr. B. K. Van Norwick, "V.," an old Erie operator. He is agent and operator.

At night we find Mr. C. Koch, "K. O.;" he is a young beginner, "just over."

We now walk down to 68 Broadway, where a week ago we could have found Mr. F. M. Huntington, who is agent for N. J. M. Railway, and manager of the Midland telegraph. He has quite a run of custom, but the company, he says, don't give him facilities enough to compete with the Western Union. Frank came from the west—Michigan, we think—and he is known quite well throughout the Western States—some of them. He has left the N. J. M. Railway to seek a position elsewhere, and Mr. Sidney S. Colton fills his place. We have mentioned this gentleman once before when on our trip over the N. J. M. Railway.

We will finish our "Paterson operators" in our next. P'S AND Q'S.

Practical Advice.

NEW YORK, Nov. 10.

TO THE EDITOR OF THE TELEGRAPHER.

THERE would seem to be, judging from the columns of THE TELEGRAPHER, and the communications from Messrs. Little, Craig and Edison in other newspapers not specially devoted to telegraphy, a perpetual wrangle going on in regard to the invention and ownership of automatic telegraph apparatus and devices. Is there not some way in which these personal claims and interests can be settled, and the telegraphic and general public, who really care very little about them, can be relieved of the everlasting din of the claimants? It is much more important to the public that the automatic telegraph, if it is what is claimed for it, should be more generally introduced than that Little, Wheatstone, Edison, or any other man should have the credit or emolument arising from the invention or inventions.

Mr. Orton makes a telling point when he states what is obviously true, that the single line constructed for the Automatic Telegraph Company in 1869, between New York and Washington, is, after four years, the only one on which that system is used in this country. It is true that automatic instruments have been temporarily used on other lines in connection with the Morse, but the Automatic Telegraph Company is still dingling away on its solitary Washington wire, and so far as outsiders can perceive, with no prospect of ever adding to it.

It is evident that there has been bad management of automatic interests somewhere, or else automatic telegraphy is, as the Western Union people claim, a delusion. If it is a practical and valuable system, for heaven's sake stop quarreling over it and put it before the people in a proper light.

It is folly to suppose that capitalists or existing telegraph companies are going to invest or adopt a system, the ownership of which is likely to be the subject of protracted dispute and legal proceedings. The course which is being pursued is likely to render it, however great may be its merits, utterly worthless practically, and prevent indefinitely its farther introduction. While Little, Craig, the Automatic Telegraph Company and others are quarreling over the shadow the substance is likely to disappear and no one be benefited by it. I do not take any side in this many sided quarrel, but if there be any sense left in the belligerent parties, I desire that they shall manifest it. A DISGUSTED TELEGRAPHER.

The Mobile and Ohio Railroad Telegraph.

MISSISSIPPI, Nov. 1.

TO THE EDITOR OF THE TELEGRAPHER.

AS I see nothing from this part of the country in THE TELEGRAPHER, I thought I would write you a few lines, and I will begin at Macon, "S" office, first. Mr. T. F. Dunaway, our worthy chief operator, he is a good man, and has the esteem of every operator on his division. Mr. C. E. Mayne, one of the train dispatchers is a good man, and a lightning operator. He was up the road the other day, and I had the pleasure of a shake with him. I think Cliff is a "bully boy."

Mr. J. W. Ellsworth, dispatcher, is a new man on the line, and I can say nothing for or against him, but so far I think he is a nice man. "S. has a good crew." Next is Brooksville. Mr. W. F. Lockard holds forth there. At Crawford we find Mr. N. S. Carr; Artesia, Mr. Wm. Meader; Tibbee, Mr. O. J. Stovall; at West Point, Mr. J. K. Garner, and at Mldon, Mr. J. A. Lockard. All good boys. Well, I guess I have written enough this time. Will finish in my next. L.

THE TELEGRAPHER is the only recognized independent telegraphic and electrical journal in this country.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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MORE THAN TEN YEARS, -

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Publisher.

Telegraphic Construction and Management in the United States.—Their Errors and Defects.

In presenting to our readers in the last number of THE TELEGRAPHER a statement of the management of the Montreal Telegraph Company and its excellent results we alluded to the contrast which it presented to that which has heretofore been common in the United States. And in referring to the competitor of the Montreal Telegraph Company, the Dominion Telegraph Company, we understated the amount of the dividend paid last year by that company, which was seven instead of five per cent. The latter company has also constructed the present season about 700 miles additional of poles, and 1,000 miles of line, and we are informed, notwithstanding the general depression in business, it will show a favorable result to the stockholders of its business for the current year.

The policy adopted in the construction of most of the American telegraph lines has been such as to enrich the contractors and promoters, while it has left a legacy to the actual stockholders and the public anything but profitable or encouraging. Instead of the lines being built by the company, substantially and economically, they have been put up by contractors whose interest and policy it has been to obtain the highest price possible and construct the cheapest line that could be made to pass muster. The inevitable result of this has been that in most cases the original line has been poorly constructed, often of inferior materials, and, of course, has rapidly deteriorated, and required heavy additional expenditures within a comparatively brief period for repairs and reconstruction. Generally, pretty much all the original capital has been expended before this stage was reached, and the additional capital required has had to be provided by issuing more stock at a small percentage on its nominal value, or the company is subjected to an indebtedness which hampers and not unfrequently ruins it.

Those who have been familiar with telegraphic enterprises in this country in the past are well aware of the manner in which they have usually been inaugurated. Instead of a company being organized to build the line, and making a careful investigation into the proper, most substantial and economical method of doing the work, certain persons select a territory which they consider favorable for their purpose, organize a company themselves, with a few others, who, for a certain amount of bonus stock, allow their names to be used as officers, directors and stockholders. The next step is for the originators of the scheme to make a contract with themselves at exorbitant prices for the construction and equipment of a certain extent of line. Usually these contractors agree to take stock and bonds of the company for their compensation, and this is the excuse for the nominally exorbitant price contracted for. The enterprise having proceeded thus far, the next step is to dispose of the stock to actual investors. Attractive circulars are issued in which extravagant statements and estimates as to the prospective business of the company and the profits to be derived from it are made, and to induce bona fide subscriptions the stock is offered at from 25 to 50 per cent. of its nominal par value. Many have been induced by these means to invest in enterprises which, as managed, had not the slightest chance of reimbursing their investment or paying even a nominal dividend upon it. We do not propose to be personal in these articles and, therefore, only make general statements which, we have no doubt, many of our readers can easily verify by instances within their own knowledge.

When the lines are actually built they are represented by an absurd nominal capital, which has been created by the issue of bonus stock to promoters and contractors, and those who, whether they realize the fact or not, are neither more or less than stool pigeons for entrapping unwary investors, and by issuing two to four shares for the actual price of one. Then they are turned over to the stockholders, who, after a brief season of self-congratulation, find that they have a very hard task to make them pay working expenses and

cost of maintenance, leaving out of question any prospects of dividends. Usually the ultimate fate of such lines is either to be sold out by mortgagees or at sheriff's sale and purchased by some solvent concern, or consolidated into the organization with which they were ostensibly established to compete.

We hope and believe that the time for the establishment of telegraph companies and the construction of telegraph lines in this manner has passed away, never more to return. Telegraphic enterprise has suffered most severely and justly in the estimation of capitalists from this policy, and we doubt whether much money could now be obtained for any further similar experiments.

The cost of telegraphic management and operation in this country is out of proportion to the amount of business done, and too often the net proceeds are absorbed by "rings," which are enriched at the expense of the stockholders and the public. The complicated system of doing business adopted by some telegraph companies entails large additional expense without any adequate result, and if, even after all some profit remains it looks very inconsiderable when divided among the shareholders, on the nominal value of their stock. The amount of money which is annually wasted in carrying on the telegraph business in this country is very large, and if it could be definitely got at would astonish, perhaps, the managers of telegraph companies themselves.

It is time that there should be a thorough and radical reform in telegraphic management in this country; and we hope that the time is not distant when there shall be established a telegraphic organization which shall include the lines and companies now competing with the Western Union combination, and which, organized upon a fair and reasonable basis as regards capital, managed efficiently and with real economy, national in its character, shall, by pursuing the policy which has resulted so favorably in Canada, demonstrate the practicability of permanently successful and remunerative telegraphy in this country. That this is feasible and practicable there can be no doubt.

Every person who is connected with the telegraphic business, however humble may be the position occupied, is personally and directly interested in this matter. THE TELEGRAPHER, in the interest of the employes as well as of the investors in telegraphic property and the public, has consistently advocated such a policy as that above reiterated. The present seems to us to be a favorable time to bring this matter forward and urge it upon the attention of those who have telegraphic interests in their charge. It is evident that there must soon be some change in the present telegraphic situation, and we are desirous that it should be a change for the better and not a repetition of the errors of the past.

It is improbable now that the telegraphs of the country will be interfered with or taken over by the Government as a part of the postal service. The management of the telegraphs will be left, as it should be, to private enterprise, and it is desirable that this management should be efficient, comprehensive and economical, so as to properly satisfy the public and leave no excuse for the clamors for Government telegraphy, which have for the last two or three years obstructed to some extent telegraphic progress.

The telegraphs, while furnishing adequate facilities to the public, should and could be reasonably remunerative to those engaged in their administration and operation, and to those who have or may invest their capital in it.

The Direct United States Cable.

AS WILL be seen from the cable despatches published in another column, after laying the new cable to within less than 200 miles of the point off Newfoundland, where it was to be spliced to the sections previously laid, a fault was discovered in the cable too late to stop it before it had been paid out from the Faraday, and, in consequence of a heavy gale prevailing, the cable was cut and buoyed. This will, perhaps

cause a delay of some days in completing the work, but it was intended, as soon as the gale had subsided, to recover the cable, cut out the fault, and finish laying it. We trust that this may be accomplished in season to enable us to announce that the cable is in successful operation in the next issue of THE TELEGRAPHER.

Up to the time the fault above mentioned was discovered the expedition had made good progress, notwithstanding the weather had much of the time been unfavorable.

Departure for California of Dr. L. Bradley.

On Tuesday last our esteemed scientific friend, Dr. L. BRADLEY, left this city for California, where he will spend the winter for the benefit of his health, which has been in an unsatisfactory condition for some months past.

Dr. BRADLEY takes with him a set of his latest and most improved apparatus for electrical measurement, which he intends to introduce to the notice of the electricians of the Pacific States. As now constructed this is by far the most convenient, accurate, and generally useful apparatus for this purpose in use either in this country or abroad. Dr. BRADLEY has succeeded in largely reducing its size, weight and cost, so that the complete apparatus, comprising a four coil tangent galvanometer and rheostat of over 10,000 units, is packed in a cylindrical box six inches in diameter and seven inches deep. For general telegraphic line work the value of Dr. BRADLEY's invention can hardly be overestimated.

Our California friends are no doubt familiar with the Doctor's reputation as a scientific electrician and inventor, and it is perhaps hardly necessary for us to bespeak for him a kind and cordial reception from them.

He has arranged for carrying on his business, during his absence, as usual at his Jersey City establishment, by thoroughly competent assistants, who have been with him for a long time. Dr. BRADLEY's address, during his absence, will be Oakland, California.

Personals.

Messrs. I. D. PURKIS and HUGH NELSON, the Superintendent and Assistant Superintendent respectively of the Dominion Telegraph Company, were in New York on business of the company this week.

Mr. FRANK L. POPE is recovering from his late severe and protracted illness, and it is hoped in a few days will be able to resume his labors.

Mr. JAMES GAMBLE, General Superintendent of the Western Union Telegraph Company, Pacific Division, has recently been on a visit East, and was in New York a few days since.

Gen. ANSON STAGER, General Superintendent of the Western Union Telegraph Company, Middle Division, favored New York with his presence a few days since.

The Telegraph.

By Cable.

THE DIRECT UNITED STATES CABLE.—PROGRESS OF THE FARADAY IN LAYING THE CABLE.

LONDON, Nov. 5.—The following despatches have been received from the steamship Faraday, engaged in laying the Direct United States Cable:

STEAMSHIP FARADAY, Nov. 3—1 P. M., }
Lat. 50 14, lon. 28 07. }

Paid out 776 knots of cable. A heavy northwest gale prevails.

STEAMSHIP FARADAY, Nov. 4—8 A. M., }
Lat. 50 03, lon. 30 59. }

The gale is abating, but there is a very high sea. Have shifted paying out from the fore to the aft tank successfully. Paid out 871 knots.

STEAMSHIP FARADAY, Nov. 4—1 P. M., }
Lat. 50 03, lon. 30 59. }

Paid out 893 knots. A strong gale and high cross sea prevail. Going at full steam with fore and aft canvas set.

STEAMSHIP FARADAY, Nov. 5—8 A. M.

Paid out 129 knots of cable since last report. There is a heavy swell.

LONDON, Nov. 6.—A despatch from the steamer Faraday, dated one o'clock this afternoon, reports the steamer in latitude 49 1 and longitude 37 47, and announces that 1,197 knots of the cable have been paid out.

LONDON, Nov. 9.—The following despatches have been received from the steamship Faraday.

ON BOARD THE FARADAY, Nov. 7, }
Lat. 48 57 N., lon. 40 16 W. }

We have paid out up to this time 1,319 miles of cable. Operations have been retarded by a heavy storm.

NOVEMBER 8—8 A. M.—Up to this time we have paid out 1,461 miles of cable. The weather is favorable.

A FAULT DISCOVERED.—THE CABLE BUOYED.

NOVEMBER 8, 6 P. M.—A fault has been discovered in the cable, but too late to prevent it from being passed overboard. The wind is blowing a gale. We shall buoy the cable.

THE POSITION OF THE FARADAY WHEN THE CABLE WAS BUOYED.

LONDON, Nov. 9.—The Messrs. Siemens conclude that when the cable was buoyed the Faraday was in latitude 48 deg. 37 min. north, longitude 44 deg. 55 min. west. The depth of water was decreasing, the ship being 180 miles from where it was intended to splice on the shore end.

THE BRITISH GOVERNMENT HAS NO INTENTION OF PURCHASING THE OCEAN TELEGRAPH LINES.

LONDON, Nov. 11.—The Right Hon. Sir Stafford Northcote, Chancellor of the Exchequer, replying to a communication from the Chairman of the Board of Directors of the Direct United States Cable Company, says the English Government has no intention of purchasing the Direct Cable or any other ocean telegraph line.

Consolidation of the Atlantic and Pacific and Franklin Lines.

At a meeting of the stockholders of the Franklin Telegraph Company, held at Boston, Mass., last week, a resolution was adopted to lease the entire lines, etc., of the company to the Atlantic and Pacific Telegraph Co. for 99 years, at a rental of not less than \$25,000 per year. The lines of both these companies have been under one management for the last two or three years, the Atlantic and Pacific Company owning a majority of the stock of the former company. The lease has not yet been completed, but will be at an early day.

The Dominion Telegraph Company.

THE Dominion Telegraph Company of Canada has, during the past season, completed a second line from Toronto to Montreal by another route from that of the first line, which increases the facilities for their growing business, and decreases the chances of interruption from storms or other causes.

This company has now about 6,000 miles of line and 300 offices, and, notwithstanding the depression in business, have paid their usual semi-annual dividend of 3½ per cent. for the first six months of the current year, and will be able to pay a similar dividend for the balance of the year. Their stock is selling at 107 to 108 for the \$100 shares, and is considered a good investment at that price.

Foreign Telegraphic Notes.

THE total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended October 17, 1874, was 406,067, an increase of 45,279 on the corresponding week of last year.

The Eastern Extension, Australasia, and China Telegraph Company announce that communication has been restored with Hong Kong on their line, and that messages can now be forwarded to China and Japan "via Falmouth."

At the half yearly meeting of the Anglo-American Telegraph Company, recently held in London, the chairman stated that the cable of the Direct United States Cable Company had been buoyed off Newfoundland on what they believed to be a portion of their monopoly; they had accordingly applied for an injunction to prevent the landing of the cable, which had been granted.

He also stated that the decrease in receipts this year was £87 per day, and not £500 as had been stated by a shareholder, and latterly they had begun to increase. The cost of laying the last cable had been £475,000.

They had from last year resources amounting to £235,000; the balance had been defrayed from this year's revenue.

The interruption which occurred on the China section of the Eastern Extension, Australia and China Telegraphs, about forty-six miles from Hong Kong, was found to have been caused by the cable having been wilfully cut, and about a mile and a half of it stolen. A reward was offered by the Government of Hong Kong, which resulted in the detection of the offenders, who have been convicted and sentenced to fourteen years imprisonment, and their junk has been confiscated.

THE Indo-European Telegraph Company announce the restoration of the Singapore-Saigon Cable. Messages for Saigon, Hong Kong and Amoy can, therefore, be forwarded via Teheran.

The Canadian Pacific Telegraph Line.

ACCORDING to a telegram published in to-day's issue, the contract for the construction of the western section of the Canadian Pacific Telegraph Line has been finally awarded to Mr. F. J. Barnard for \$750,000—\$1,000 per mile for construction, and \$50,000 per year for five years for maintenance. The contractor is bound to fulfill the following conditions: To furnish all materials, labor, instruments, and everything to put the line into operation; to maintain the line for a period of five years after its completion; and in the wooded section the land is to be cleared to the width of 132 feet, or such greater width as may be necessary to prevent injury to the line from fires or falling trees. The Canadian Pacific Telegraph Line is divided into six sections, covering an approximate distance of 3,200 miles, and according to the Ottawa Free Press, the highest tender for the construction of the whole line was \$5,000,000, the lowest \$1,250,000.—The Cariboo Sentinel.

Increase of Telegraph Lines in Russia.

We learn by a letter from St. Petersburg that the Russian Government, owing to the enormous increase in the number of telegrams, as the necessary consequence of the reduction of charges, has resolved to augment the present facilities for telegraphing by laying down the following auxiliary and branch lines: From St. Petersburg to Tschudovo, from St. Petersburg to Novaya Ladoga, from Moscow to Orel, from Moscow to Wjasna, from Moscow to Kolomna, from Wilna to Minsk, from Nishni-Novgorod to Kasau, from Ssyfran to Samara and from Sympheropol to Berdiausk. For the execution of these works, which are all to be completed in the course of next summer, the capital required is estimated at 147,000 roubles, which are to be raised by legislative Act of the Council of State. At the same time the administration of the telegraphs asks for a credit of 86,000 roubles to purchase the materials for putting up the wires and posts next year on the line between Tomsk and Irkutsk, which must be completed and opened for public use in 1876.

We learn further from the same source that a request has been made by the British Ambassador at the Russian Court, as also by the Commander-in-Chief of the fleet and ports of the Black Sea, for an extension of the telegraph by a new land line from Nicolayef to Otchakof, and that the subject is under the consideration of the Administration. This new electro-magnetic line is intended to replace the present optical telegraph, which is found not to answer its purpose, its working powers being so frequently interrupted by the fogs prevalent in the Black Sea. The line acquires importance as being the means of reporting the state of the weather and the sea, the navigation of the River Bug, and for communicating instructions for vessels arriving for orders, and sending assistance to ships in distress. The English Government wish to see the line made in the interests of general commerce and navigation.

[From the Sydney Herald, Sept. 7.]

The Telegraph in Australia.

An experimental message was sent yesterday to Java from Sydney, and a reply received in two minutes and thirty-five seconds. The distance travelled by the electric current was 8,700 miles. The rapidity of manipulation in so short a time is proof that we have good operators. The current of electricity from Sydney to Port Darwin was instantaneous.

The Western and Brazilian Telegraph Company.

THE Western and Brazilian Telegraph Company announce that telegraphic dispatches, in any language, can be prepaid to Buenos Ayres, the charge for twenty words being £12 3s. 8d., and half that rate for every additional ten words. Messages for places beyond, and the west coast of South America, should be ad-

dressed "Oldham, Buenos Ayres," the further charges being collected from the receiver.

The traffic returns of the above company have been as follows:—From opening of line to end of June, 1874 (for local traffic only) £16,000; since opening of Brazilian submarine line, giving communication with Europe, the returns show for July £7,668; for August £8,506; and for September £6,957. During September there was an interruption between Bahia and Pernambuco for seventeen days. Communication with the River Plate and west coast of South America (save by land lines), also with the West Indies and North America is not yet established, but vessels with completing sections leave England in November.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

NOV.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.	GOLD AND STOCK.
5	78 ... 79½	18 ... 18½	40 ... 40	60 ... 70
6	79½ ... 79½	18½ ... 20	40 ... 40	60 ... 70
7	78½ ... 79½	19½ ... 20	40 ... 40	60 ... 70
9	79½ ... 79½	19½ ... 19½	41 ... 41	60 ... 75
10	79½ ... 79½	19½ ... 19½	40 ... 40	60 ... 75
11	79½ ... 79½	19½ ... 20	40 ... 40	60 ... 75

New Patents.

For the week ended Oct. 6, 1874, and bearing that date.

155,596.—ELECTRIC SIGNALING APPARATUS FOR RAILWAYS.—Richard A. Stuedell, Chicago, Ill., assignor of one half his right to Hermann G. Nuscheler, same place. Filed May 11, 1874.

Electro-magnetic engine running on track in advance of regular train, and connected therewith by electrical conductors. The magnetic engine, meeting with any obstruction or danger, causes the circuit to the train to be broken, and an alarm given by apparatus carried on the train.

1. The combination, with a signalling instrument situated upon a railroad train, of an electro-magnetic engine, running in advance of such upon the same track, and of conductors electrically connecting such engine and signal apparatus, the latter being controlled by the electro-magnetic engine, and caused to signal an approach of danger, substantially as herein shown and described.

2. The combination of the signalling magnets H and I with the armature lever J and brake-arm K, constructed and operating substantially as set forth.

3. The combination, in a magnetic engine, of the driving magnets E, F and G, with the signalling and brake magnets H and I, all connected with and operated by a single battery, substantially as specified.

4. The outrunner or broken rail detector, composed of the bars V W, supported and kept in contact by the rail, in combination with the wire i and magnets H and I, substantially as described.

5. The bar z in combination with the head block w or other support, the spring r and plates q for indicating obstructions, substantially as specified.

For the week ended October 13, 1874, and bearing that date.

155,858.—ELECTRIC CAR DETACHING DEVICES. William W. Carson, High Bridge, N. Y. Filed March 28, 1874.

Coupling bar held to frame of car by a latch, which can be thrown off by the explosion of a small cartridge. Cartridges exploded by an electrical circuit from a frame hung between trucks; car jumping track causes frame to bump on track and operate the circuit closers.

1. The improved electric car detaching device, consisting of the pivoted lever frames of the trucks, the mechanism for releasing the draw head, and an automatically closed electric circuit, substantially in the manner and for the purpose set forth.

2. The pivoted lever frame B, composed of pendent rod a, with pivoted bottom rods d, combined by intermediate lever connection and tongue piece h, with spring h' and contact h², for closing the circuit automatically when the car wheels leave the rails, substantially as specified.

3. The combination latch D, cartridge chamber C', pivoted to guide frame E, band spring D', and pivoted cross bolt F, and an electrical circuit for firing the cartridge, all operating substantially in the manner set forth, for releasing the draw head.

4. The combination of pivoted latch D, having cartridge chamber C', with connecting channel l, and recess m, frame E, having projection or piston m', and an electrical circuit for firing the cartridge, substantially as and for the purpose set forth.

155,900.—ELECTRIC RAILWAY SIGNALS. P. Tesse, H. Lartigue and P. D. Prud'homme, Paris, France. Filed May 6, 1874.

Relates to devices for system in which the setting of a signal indicating that a train has entered on a certain section changes the electrical circuits, so that a signal is set at the far end of the section, which, being set, causes a secondary signal to be given at the point of setting of the original signal, indicating that the signal has been received at such far end.

1. The combination of the large arms of a semaphoric mast of one station with the smaller arms of a similar mast at another, and their respective electrical apparatus E, as hereinbefore described, all constructed and arranged substantially as and for the purpose set forth.

2. The combination of the arms A B' and a b, the chime bells, and the electrical apparatus E, substantially as and for the purpose described.

3. In the electrical apparatus E, the commutator O, provided with the connections set forth, in combination with the crank B, spring contacts E', L' L', and —, and a battery, substantially as and for the purpose described.

4. The combination of the arm D, cam C, and pawl W with the movable arm B for locking the arms of the mast, the large

arms in a horizontal and the small arms in a vertical position substantially as and for the purpose specified.

5. The combination of the electro-magnet E', the armature P', levers R and J, and counter-weight G, for unlocking the arms of the mast, substantially as and for the purpose specified.

6. The combination of the electro-magnet H, the armatures f and g, the spring Q, the annunciator V, rod S, lever J, and bell T, for acknowledging the receipt of the signal substantially as and for the purpose specified.

7. The combination of the treadle C, swan neck j, abutment V, drum E', pin a, and weight cord with the axis X of the electrical apparatus E, for the purpose of allowing the passing train to operate the signals automatically, substantially as and for the purpose described.

Died.

CREIGHTON.—At Omaha, Nebraska, Friday, November 6, 1874, from a stroke of paralysis received on the 3d instant, EDWARD CREIGHTON, the contractor for and builder of the first telegraph line to California.

Obituary.

EDWARD CREIGHTON.

We are frequently reminded by the announcement of the decease of persons formerly prominently connected with early telegraphic enterprises that the generation which assisted in establishing and developing the electric telegraph in this country are rapidly passing away.

EDWARD CREIGHTON, whose decease at Omaha, Nebraska, of which place he had been for several years a leading citizen, was announced in a brief despatch from that place on Friday, of last week, will be well remembered by many of our telegraphic readers as the contractor for and builder of the first telegraph to California.

He was born in Belmont County, Ohio, August 31, 1820, and was but a little more than 54 years old at the time of his death. His first connection with telegraphic enterprises was in 1847, he supplying the poles between Springfield and Cincinnati, for the Pittsburgh, Cincinnati and Louisville telegraph line. He also provided the poles for the line between Cincinnati and Louisville. In 1848 he engaged in telegraph construction, under Mr. Henry O'Reilly, and built part of the People's Telegraph Line from New Orleans, La., to Aberdeen, Miss. From that time until 1852 he was engaged in the construction of various telegraph lines, among them the House Printing Telegraph Lines from New York to Buffalo, and the line of the Mississippi Valley Printing Telegraph Company from Buffalo to Louisville, Ky. For the next seven years Mr. Creighton was employed as the general agent of the Western Union Telegraph Company, laying cables across the principal streams, and generally surveying and pioneering their enterprises.

In 1859-60 he examined the different routes proposed for the line to the Pacific Coast, and finally reported in favor of the route from Omaha to California via Salt Lake, which, on his report and his expressing his willingness to undertake its construction, was adopted. The energy with which this great work was pushed through under Mr. Creighton's personal superintendence is shown from the fact that it was commenced July 4th, 1861, and communication established October 24th of the same year. Of this line the 700 miles west of Omaha, via Julesburg, was constructed by the party under Mr. Creighton, connecting with another party under Mr. Stebbins, who built 400 miles of the line from Salt Lake east. After the California line was built, Mr. Creighton was appointed superintendent of the lines west of Chicago, until February 1, 1867, when, on their being consolidated with the Western Union Telegraph Company he resigned. He continued to be engaged in the construction of telegraphs west of Omaha until 1869.

Mr. Creighton was largely interested in various enterprises in Omaha, and west of that point, which were very remunerative, and had acquired a fortune which entitled him to rank as a millionaire. He was a valuable citizen to Omaha, and his loss is greatly felt there. Personally he was a genial, kind hearted man, a faithful friend and excellent companion.

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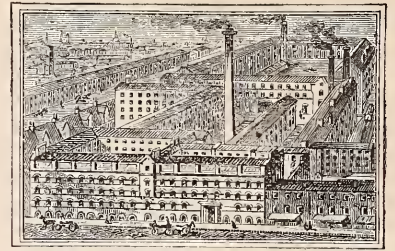
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The SPENCERIAN PENS are manufactured of the very best material by the most expert workmen in Europe, and are famous for their elasticity, durability and evenness of point.

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We make Fifteen Numbers of Pens, differing in flexibility and fineness of point, adapted to every style of writing, as follows:

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- No. 3. COMMERCIAL PEN. *Point Medium.* An Easy Writing Business Pen.
- No. 4. LADIES' EXTRA PEN. *Point Extra Fine and Flexible.* For Delicate Fine Hand Writing this is a very superior Pen.
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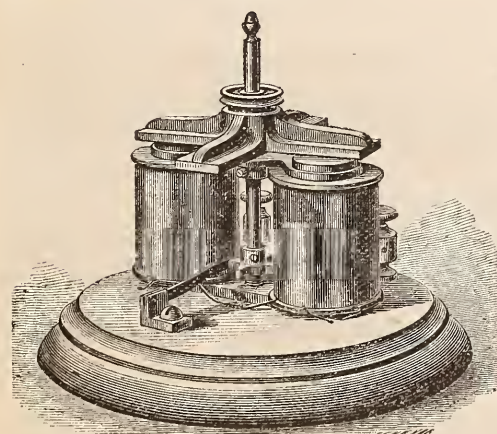
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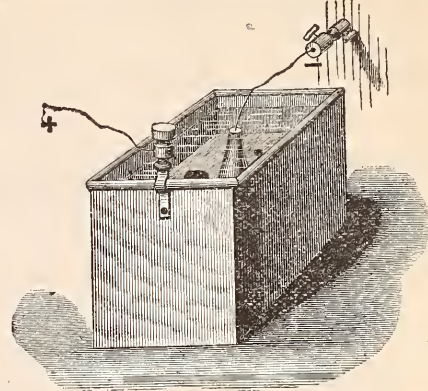
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RELIABILITY and
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ABSOLUTELY PERFECT!

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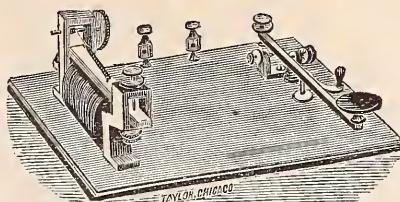
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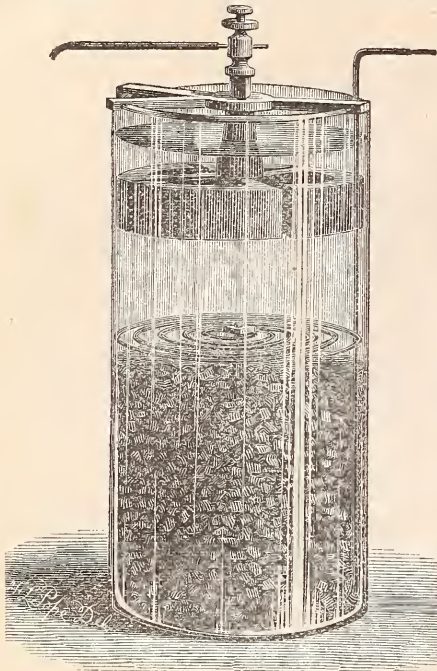
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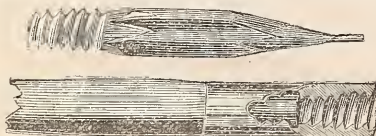
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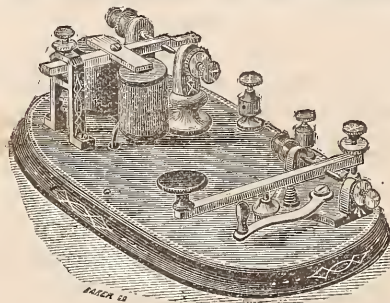
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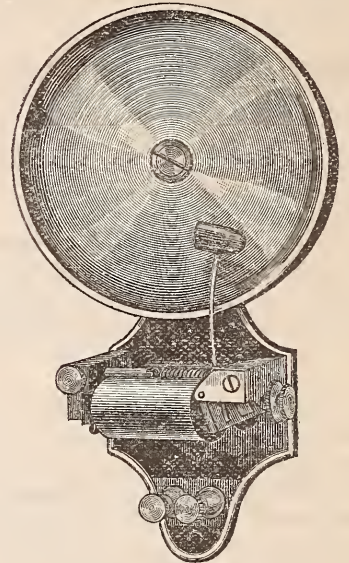
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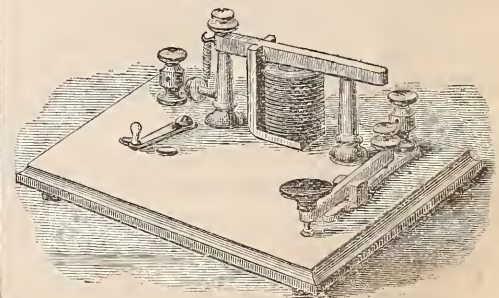
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A Journal of Electrical Progress.

Vol. X.

New York, Saturday, November 21, 1874.

Whole No. 436

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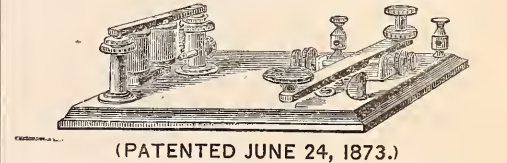
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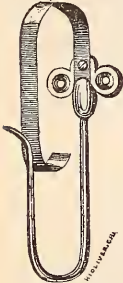
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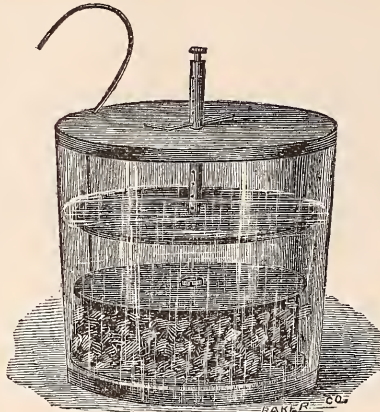
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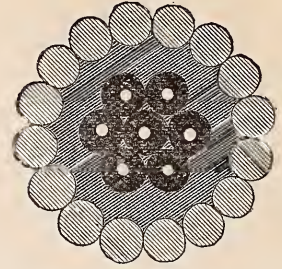
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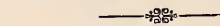
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, NOVEMBER 21, 1874.

VOL. X. WHOLE No. 436.

[From the Journal of the Society of Telegraph Engineers.]

Indian and American Telegraphs.

In March, 1873, Mr. W. E. Ayrton read a paper entitled "On some points in connection with the Indian Telegraphs" before the Society of Telegraph Engineers. This paper is published in No. 5, vol. ii, of the Journal of the Society.

Mr. Ayrton first refers to the application of Mr. Schwendler's formula for reducing the apparent or observed resistance of either insulation or conductivity to its true value. Soon after the publication of Mr. Schwendler's formula I applied it in the measurement of insulation and conductivity of overland lines, but never found it to agree, or even approximate to the result of a careful measurement, taken under circumstances where the insulation resistance was so large as not to affect the result, as measured in the ordinary manner; that is, to take the mean of the observed resistance with alternating poles of the battery.

Mr. Schwendler's formula is based upon the supposition that the insulation conductivities are uniformly distributed throughout the line—a condition of affairs that never exists in this country except in clear or cold weather, and when the escape of current by the insulators is so small as not to enter into the result.

In summer long lines are often affected by local showers—it may be clear on some portions and raining at others. During general rains, "northeast storms," humidity that affects insulators is very unevenly distributed—raining in some portions and only cloudy in others. The conductivity of insulation is never stationary under these circumstances, but as varying as the amount of rain fall at different intervals. I refer to the ordinary glass insulators of this country.

On very old wires, whose resistance is great through bad joints, conductivity is immensely improved by rain or dampness; so that, in my experience, it is idle to attempt the measurement of wire resistances or line conductivities, except by short sections or under favorable conditions of weather.

Mr. Ayrton says, "We have learned two very important facts," one of which is, "that the insulation of sections varies enormously under the same climatic influences." If this be true, how do they arrive at the real conductivity of the wire? It also speaks badly for the insulators, provided we are to understand by the term "same climatic influence" that there is sensible leakage on any portion in clear weather.

A porous porcelain insulator conducts in clear weather; a glass insulator under same circumstances does not. By this is meant, when both are exposed to the sun's rays and not affected by moisture on the surface.

Mr. Ayrton enters into a calculation by which he is led to believe the consumption of battery material is increased in his particular case 60 per cent. by the introduction of the 1 per cent. of bad insulators. This calculation leads to erroneous results, inasmuch as it is based upon the supposition that there is no consumption when the circuit is open or the exterior resistance is infinite. Consumption of material is going on when the circuit is open, and this is particularly the case with the kind of battery he refers to as used in India—the Menotti.

In our country this battery, without the intervening layer of sand or sawdust, is most used. It is best adapted to our mode of working the closed circuit system. The size of the elements is sufficient to bring the resistance down to five, and sometimes two Siemens units per cell. If the battery is much worked this fact tends to keep the solutions separate. The more wires worked from the same battery, or the less the exterior resistance, the less the local action, and in this sense the more it is worked the greater the economy.

It answers admirably for working many lines from the same battery.

This battery is called the Callaud, and is essentially the same as used by the French at their central station in Paris.

Mr. Ayrton describes the manner of testing insulators at the factory and upon their arrival in Bombay, showing the great care bestowed upon the insulation.

Are the benefits derived commensurate with the care bestowed?

This question was put in another form by Mr. Preece,

and the answer of Mr. Ayrton is, "In dry weather the insulation varied from five millions a mile to over three hundred; in wet weather it was as low as half a million;" and that "the average was two to three millions in wet weather."

I infer that better results are obtained in this country with our poorest insulation. In measuring say 100 miles, we seldom find it as low as one million per mile in rain. Leaving out the city portions, it will run as high as eight, and seldom as low as four millions.

If we desire the insulation from this city to New York, the insulation of the same wire will measure twice as high when taken from the outskirts, and say six miles of city lines excluded, as compared to the entire line, including city portion, where the measure is taken from the central station.

The insulation in cities is greatly reduced by smoke and gases of combustion, which "short-circuits" the insulation, making the result appear below the average. Again, measuring from the country into a city, where the insulators are thus affected, the results appear above the average. Comparing the insulation of the lines in India, I should infer they could be improved by using the common insulator of this country.

As regards progress in insulation, are they to be compared with many lines in this country that average at least one hundred millions per mile in rain? We have thousands of miles of such lines in which I have a personal interest, and it would be out of place for me in this article to refer to them in detail.

EARTH PLATE.

The second "important fact" developed by the mode of testing in India, was that the earth plates had "a high resistance and were intensely polarized." "This was remedied by using large copper earth plates with leading wires insulated from the ground."

Many people think copper better for ground plates than iron, in an electrical sense, but copper, on account of its better conducting qualities, possesses no advantage over iron, and zinc coated iron is more economical and equally durable.

What advantage copper possesses over iron for ground plates I am unable to see. A ground plate is simply a joint between two conductors—the wire and the earth—the latter specifically being a very poor conductor. If the sections of an iron and copper wire were joined, the iron being six times as large as the copper to insure equal conductivity, the section of iron in contact with the copper would not conduct sufficiently to make a joint equal in conductivity with a section of either the iron or the copper wire. But if we enlarge the end of the copper so as to cover the section of the iron, then the joint has a capacity for conduction equal to a section of either. We can, after understanding the nature of this joint, draw upon the imagination to form an idea how immensely an iron wire must be enlarged, and the extent of surface exposed, to fulfil the conditions of a joint with the earth. Supposing the earth in contact with the plate to be one fourth saturated or contain one-fourth moisture, the plate would require at least ten thousand square feet of surface in contact with the earth to ensure a joint electrically perfect, or equal to a section of No. 8 iron wire.

With perfect joints the immense suction of the earth, considered as a conductor, adds nothing to the resistance; or, in other words, if we make two perfect joints with the earth, there is nothing added to the resistance of the circuit.

The defects of ground plates in connection with lightning rods have been much discussed by the meteorological section of the Franklin Institute of this city lately. It has been the custom to terminate lightning rods in dry earth, often without any plate attached. It is the belief of those who have given the subject much attention that rods thus constructed are the cause of more harm than protection.

Every summer many valuable barns with their contents are destroyed, and in a majority of cases these barns are supplied with rods improperly connected with the earth. These rods draw the discharge from the clouds, and, there being insufficient means of getting from the rod to the earth, the charge flies to neighboring conductors, often log chains, ploughs, cart tires, or other metallic substances, igniting the combustible material with which these buildings are stored.

As an experiment, two plates, containing nine square feet of surface each, were buried fifty feet from each other, using the two plates and the earth as a portion of the circuit. They gave a resistance of 150 Siemens units. Allowing a stream from a hydrant to flow directly over each plate, with holes in the ground above, so as to completely saturate, the resistance of these plates, or rather the earth in contact, was reduced to 32 units, or 16 units each, compared to an entire metallic circuit of No. 10 wire, 100 feet in length. By substituting 50 feet of wire in place of the earth, total resistance was reduced 32 units.

Instead of lightning rods being connected to the earth in an electrical sense, they are, in truth, insulated from the earth.

People have often found it difficult to work short

lines of telegraph in this country where the earth was used as a portion of the circuit, and connection was made or attempted by an ordinary ground plate, exposing insufficient surface.

The writer was called to explain a difficulty of this kind about two years ago. A line, one mile and a half in length, connecting a factory with the proprietor's residence, was constructed with type-printing instruments. They failed to work, from insufficient current. The battery had been increased to 100 cells, the ground plates overhauled and replaced with pure copper of increased surface, but all to no purpose, the apparent current was feeble.

The resistance of this line, including the earth connections, was found to be 1,600 units. Owing to the dryness of the soil the earth plates made poor connectors. Within a hundred yards of each terminal there happened to be a railway track; connection was made to this track, and the strength of current increased thereby to the extent that ten cells were ample to work the line.

A railway track, as the rails are joined in this country, makes a perfect ground even when the earth is dry, owing to the immense surface in contact.

A ground plate, as usually constructed in this country, seldom interposes sufficient resistance to affect ordinary lines. The longer the wire or the greater the resistance the less the effect in the proportion this resistance bears to the total resistance of the circuit.

In this sense also the polarization of the ground plates is small in proportion as the resistance of the line wire and instruments is large. In the case of the India lines or circuits of 500 miles, I am unable to see how its effects are even appreciable. Insulating the wire leading to the plate to prevent it would do so, so far as this action is local, or confined within the limits of the plate and its connecting wire.

How this effect could now be shown on the instruments of the line were the leading wires uninsulated, I am unable to comprehend.

SIGNALING.

The portion of Mr. Ayrton's paper that elicits most remark in this country is as follows: "To facilitate this reading by sound the receiving signaller gives an acknowledgment by sending a dot at the end of every word, and the sending signaller continues repeating the word until he gets this acknowledgment."

By this method, the receiving "signaller" would be obliged to drop his pen to acknowledge every word as transmitted, or at least work under great disadvantages. We are unable to see how two good operators could by this method get more than twenty messages per hour over a line, these messages to average twenty words each, while by our method of closed circuit forty messages per hour is a moderate rate of speed. The sounder, by the American plan, responds to every touch of the sending operator. Any accident or change in the condition of the line involves a change of adjustment of his relay. If such change takes place either by increase or decrease of current, the sending operator pauses for a reply from the receiving operator. On the circuits where much business is performed the operator sends for hours without a reply, yet he has assurance that every word is being correctly received. Especially is this the case when despatches are going in the other direction from the same station. The sending operator is assured of their correct transmission, otherwise he would be advised by the other wires. So it is not the custom in this country to stop sending merely for the purpose of ascertaining whether the despatches are correctly received. Whenever the sending operator stops and closes the circuit, then the receiving operator replies or acknowledges.

By the duplex system, lately introduced, this method is increased. We may say the average is from 60 to 70 messages per hour on a single wire.

I would like to hear from Mr. Ayrton how this speed of transmission compares with that of the Indian lines.

Perhaps a more pertinent question would be, Do those interested in the Indian lines get as great a return for their expenditure in erecting and operating a No. 1 or No. 3 wire by their method as obtained in this country with lines of equal length, but of less than one third the size, and the American method?

If I am able to judge fairly I should say lines in this country, costing half as much as the Indian lines, do twice or more than twice the business.

The methods of operating and maintaining the Indian lines are referred to in the light of progress or advancement in telegraphy—we are considering them in that sense from an American standpoint.

In the discussion following Mr. Ayrton's paper, Mr. Preece states "that sounders had been introduced almost entirely in America."

As early as 1860, nine tenths of the instruments in the larger and more important stations were sounders, and now there is scarcely a Morse recorder to be found in any of these stations.

The recording instruments are used only to a very limited extent, in the way stations of railway lines where the least business is performed. They are used by

operators who are learners until they are able to read by sound.

In the year 1850 "Jemmy" Leonard, of Louisville, got the reputation of being the most expert "receiver" in the country, and entirely by ear. Since that time, or soon after, it became the ambition of operators to emulate Leonard, and receiving by sound from that date has been popular.

In 1852 I designed the first sounders used upon the lines of which I had charge. They are now made with from 4 to 8 units resistance, and usually worked by two cells Callaud battery.

In the years 1867-8 Mr. Varley made a report on the lines of the Western Union Company. In speaking of relays he says, "Keep down the resistance of everything is a golden rule in telegraphy." He found the relays in the New York office "to vary from 69 to 1182 ohms," and that "the 69 ohm relay is, where it should be, on a long line No. 2 Chicago;" and further, "The resistance should not exceed 130 ohms per relay, and it will pay you to have them all re-wound." Acting upon this advice the resistance of the relays was reduced.

For circuits of one hundred to two hundred miles they averaged about 50 units, and from 100 to 200 cells of Grove battery were required to work the lines.

Mr. Ayrton says, in speaking of relays, "We have not, however, used any relays having more than about 3,600 or 4,000 ohms resistance." I merely refer to these opinions to show that "doctors disagree," and that there is no question upon which we have such a diversity of opinions as upon the proper resistance of the relay. I would like much to see a relay made to fulfil the requirements as demonstrated by Eisenlohr, Du Moncel and others.

The resistance of the relay, I will venture an opinion, has much less to do with the good working of lines, practically, than other conditions.

The Philadelphia and Reading Railroad work a circuit of 140 miles with 40 relays, average resistance 100 units each. This line is used in connection with its traffic and the running of trains. It works well in all weathers, and would were the resistance of the relays twice as large or twice as small.

The Pennsylvania Central Railroad has three similar circuits, with relays averaging 150 units each, at intervals of about five miles; this resistance is larger than necessary, but the excess, whatever it may do, occasions no inconvenience.

With ordinary insulation, or say an insulation resistance of two million units per mile, these lines could not be worked by our American system of closed circuits, with a battery at each terminal and the currents from both flowing when the circuit is closed.

When the sender opens the line the receiver's battery still sends a current through his relay over the line and insulators, which is greater or less as the insulation is good or bad; the effective or working margin is the difference between this "escape" and the whole line current. When the line current is small, owing to the resistance of wire and relays, this margin is small, and the "escape" must be kept at a minimum.

The wire in connection with all stations on the main trunk of the Philadelphia and Reading Railroad before referred to has a resistance, including relays, of over 8,000 units; with such a resistance the current passing over the line is unavoidably small, and to be able to work such circuit the current escaping by the insulators must be small in comparison to that passing through the line.

The Philadelphia and Reading Railroad Company makes a more extensive use of the telegraph than any other railway in this country; they employ ten wires on the main line, with branches in all directions, as soon as they enter the coal regions, 130 miles distant from Philadelphia.

I refer to the railways in this country because they are the only parties operating the telegraph upon anything approaching what is usually termed scientific principles; and further, all that Mr. Ayrton says of the railway telegraphs in India is of a negative character. The foregoing are suggestions upon reading Mr. Ayrton's paper, and the remarks in connection therewith of the other members of the Society.

The Chairman said that the Indian telegraphs of one period were "the roughest thing possible." "He believed at the present time the Indian telegraphs were among the most scientifically worked telegraphs in the world."

In a free and open discussion I should say it was more scientific than practical.

Real advancement in telegraphy is best shown by comparing the results obtained with the means employed.

In this connection it is proper to refer to the Automatic Telegraph Company, that operates a single wire extending from New York to Washington, a distance of about 300 miles, and doing a local business with stations at New York, Newark, Trenton, Philadelphia, Baltimore and Washington.

In this circuit there are fifteen relays. The line is

worked in one circuit; or, in other words, while transmission is going on between any two stations, the balance of the line is unemployed so far as transmission of the business of the other stations is concerned.

This company does an average daily business of upwards of 700 paid despatches. They have secured this business simply by promptness and efficiency, in competition with the old company, having its wires extended to every considerable town in the country, with hundreds of branch offices in the cities mentioned. Ninety per cent. of this business is done during the six active business hours of the day, that is, between 9 A. M. and 3 P. M.

The last annual message of the President, containing 12,000 words, was transmitted from Washington to New York in twenty-two minutes by this single wire. Is there anything in any other part of the world (including India) that can make so favorable a showing?

From 1845 to 1867 I was connected with the telegraphs in this country, except in 1851, when I constructed the first line of telegraph in Mexico, connecting the City of Mexico with Vera Cruz.

In 1867 I visited Europe, and examined the different systems with much interest; and again last year, in the capacity of United States Commissioner to the Vienna Exposition. I was appointed to make a report upon Electricity and Telegraphy. This report is now in possession of our Government. My chief purpose was to gather information of processes and methods of value and interest to our people. In the discharge of this duty I was afforded every facility at Brussels, Berlin, Vienna, Berne, Paris and London.

On the Continent we find the Hughes printing instrument largely in use at all the central stations. The speed of this instrument is given as twice that of the Morse, which is also used to a less extent. The telegraphic journals are now discussing very freely the duplex transmission system, which is more in use in this country than any other, and with great advantage. The capacity of a wire, however, is not and cannot be doubled by its use. If there were no alterations or adjustments in connection with the compensating resistances and condensers required, it might approach it, but time is necessarily lost in obtaining and preserving the balance, more especially in wet and unfavorable weather. Under no circumstances is there as much performed in this country with four operators and one wire with the duplex system as is performed by two operators and one wire with the Hughes printer in Belgium, Germany and France.

In the central station at Paris we see them working the Hughes instrument at full speed on the long circuits, Paris to Havre, Paris to Brest, Paris to Marseilles, Paris to Lyons; also on the International, Paris to Brussels, Paris to Berne, Paris to Berlin, Paris to Dover, England. When I see this instrument worked to its full capacity, or say twice ordinary Morse speed, upon those circuits, in rain or unfavorable weather, I am forced to make comparisons as to the economy and efficiency of their systems with the manner in which the business is performed in my own country and in England.

My report refers to the amount of business performed or handled in London and Paris, the number of operators required to perform the service in each of those central stations, and the number and kind of instruments used.

If the French can perform, and well perform as much on one wire as the English on four wires of the same length and resistance, with proportionately less operators, and say one twentieth the battery power (using one and the same battery for five or six lines), it cannot be denied that practically the French system of telegraphs is not to be despised, and that it might be substituted even in England or India with profit.

I could go more into details upon this subject, but I do not in any way wish to forestall an official report.

DAVID BROOKS.

Philadelphia, Aug. 21, 1874.

The Telegraphers' Mutual Benefit Association Annual Meeting.

THE annual meeting of the Telegraphers' Mutual Benefit Association was held on the evening of the 11th inst., at 145 Broadway, New York. Among the delegates present from a distance were Messrs. A. Wilson, Jr., of Baltimore; J. W. Tillinghast and N. Hucker, of Buffalo, and F. W. Jones, of Chicago, and a good representation of the members in this city and vicinity were also in attendance.

Mr. R. H. Rochester was elected Chairman, and Mr. Wm. Holmes acted as Secretary.

The report of the Treasurer and Secretary for the past year was read and accepted, as follows:

REPORT OF THE OFFICERS.

During the year ending November 1 the number of deaths has reached 18, and have occurred in 10 different States, as follows:

Alabama.....	2	Ohio.....	1
Massachusetts.....	1	Illinois.....	1
New York.....	5	Michigan.....	1
Pennsylvania.....	1	Louisiana.....	3
Kentucky.....	2	Kansas.....	1

Assessments for the two last deaths have not yet been issued, but are included above.

The five deaths which have occurred in New York were, with one exception, of those who came into the Association during the first two years of its existence. This is true also of those which occurred in Alabama and Pennsylvania. No death has occurred among those received into membership during the past year, with the exception of Mr. McDill of Kansas, who was accidentally killed.

Accompanying this report will be found a list of all deaths since the organization of the Association, with the dates, causes and places, for the information of all parties. These deaths occurred in the different States, as follows:

Alabama.....	4	Minnesota.....	1
Arkansas.....	2	Maryland.....	1
Connecticut.....	1	Missouri.....	1
Georgia.....	2	New Jersey.....	1
Illinois.....	3	New York.....	23
Indiana.....	2	Nova Scotia.....	1
Iowa.....	1	Ohio.....	7
Kentucky.....	11	Pennsylvania.....	2
Kansas.....	1	Tennessee.....	6
Louisiana.....	5	Virginia.....	1
Massachusetts.....	1	W. Virginia.....	1
Michigan.....	3		

CAUSES OF DEATH.

- 28 died of consumption.
- 9 died of fevers.
- 5 died by accident.
- 4 died of heart disease.
- 3 died of pneumonia.
- 3 died of congestion of brain.
- 20 died of various other causes.

Of the 23 deaths in New York 8 were residents of the City of New York, and 7 of these were members in the first year of the existence of the Association. The average membership of all who have died is 2 years and 4½ months.

The number of members at the time of your last annual meeting was.....	1,230
New members since that time.....	188

Certificates cancelled during the year.....	1,418
	212

Present membership..... 1,206

It may seem to some discouraging thus to report a decrease in the membership. We cannot so regard it. The year has been one of great trial. Many members have dropped out simply because they could not obtain their small incomes from the companies by which they were employed. Others needed their whole income to help to mitigate the disasters of others whose needs seemed to demand their first care and provision. And when five members died within a few days of each other, very few, indeed, felt certain that they could retain their membership were these harvests of death to repeat themselves with a sweep so often and so wide. That we stand to-day with almost unbroken ranks, and with so slight a decrease, is a subject for congratulation. It should be remembered, also, that under existing conditions, delinquency, even for imperative causes, and for a very brief period, almost necessarily closes the gates against restoration, and practically excludes hundreds, once members, as devoted and worthy as ourselves.

The condition of the finances is as follows:

Balance, November 5th.....	\$8,435 15
Received for Assessments.....	22,893 30
Received for Applications.....	297 50
Fines for Readmission.....	72 00
Gift A. D. Cunningham, of Texas.....	1 00
Interest to July 1st, 1874.....	461 24
	<hr/>
	\$32,160 19

<i>Paid to heirs of</i>	<i>Assessment.</i>	<i>Amount.</i>
Th. Wilcox.....	44	\$1,229 00
E. Wade.....	45	1,217 00
R. S. Fowler.....	46	1,230 00
W. P. Tuites.....	47	954 00
John A. Conley.....	48	1,178 00
M. H. Bacon.....	49	1,135 00
E. S. Keep.....	50	1,130 00
A. Saville.....	51	1,135 00
C. W. Hills.....	52	1,112 00
C. McCarthy.....	53	1,013 00
J. M. Worden.....	54	1,000 00
F. E. Curtis.....	55	1,000 00
G. M. Simmons.....	56	1,000 00
W. H. Kelly.....	57	1,000 00
C. P. Rasser.....	58	1,000 00
S. Porter.....	59	1,000 00
G. H. Everett.....	60	1,000 00
E. P. Reardon.....	61	1,000 00
M. C. Hart.....	62	1,000 00
T. W. Priest.....	64	1,000 00
T. A. English.....	R. Fund.	150 00
R. B. Dillon.....	65	150 00
C. B. Matthews.....	66	150 00
V. A. Shea.....	68	100 00
Printing.....		215 15
Postage.....		178 81
Refunded.....		28 00
Expenses Annual Meeting, 1873.....		21 00
Stationery.....		26 25
Secretary's Salary.....		500 00
		<hr/>
		\$22,812 21

Due hets-of	Assessment.	Amount.
A. R. Walsh.....	63	\$1,000 00
T. A. English.....	R. Fund.	850 00
R. B. Dillon.....	65	850 00
C. B. Matthews.....	66	850 00
A. J. Martin.....	67	1,000 00
V. A. Shea.....	68	900 00
Collected on Assessment.....	69	384 50
Advance Assessments.....	..	87 50— \$5,922 00

Balance—Amt. of Surplus Fund.....\$3,425 98
To which is to be added interest from July to November 1st, making a total of about \$3,700 00.

Although some dissatisfaction has been expressed at the limitation of the amount of payment at death to \$1,000, yet it has been very limited, and we believe there has been a very general acquiescence in its wisdom. It has enabled the Association to pay an assessment out of its surplus funds, and yet now to report a very handsome balance on hand.

It is suggested that if the funds be allowed to accumulate until the interest of the surplus fund meets the current expenses it would greatly strengthen the Association. A like approval of the resolution to tax delinquent members a second initiation fee on their restoration has not been manifested, and your Executive Committee, after consultation, deemed it their duty to call for an expression of opinion on that subject and finally to suspend its operation. There seems needed a careful and prudent revision of the whole subject of delinquency and the privileges of resignation and restoration.

The policy of the Association is impliedly benevolent, and its rules should be generous as well as just. Delinquents are now restored only on a new certificate of health and the payment of all back dues. It seems to be the wish of many to modify these conditions so as to restore to membership many whose necessities drove them to resignation or delinquency under the pressure of poverty or personal calamity, and yet avoid encouraging the easy shedding of the duties of membership.

It is suggested whether some definite amount of initiation fee, the whole of which shall be placed as a part of the permanent fund, may not take advantageously the place of the present sliding scale, however just it is acknowledged to be.

It is further suggested that, to members residing beyond the Rocky Mountains, the term of payment of assessments be increased from 30 to 60 days. To all these points your intelligent attention is directed.

The Association reaches its seventh anniversary with what we believe to be a worthy record, and with all the conditions by which its future success and usefulness seems assured. The few faults which now impede its more enlarged and acceptable membership once removed, and the terms of connection made generous, the Association should find a friend in the entire brotherhood of the telegraph, and go on with renewed vigor and widened usefulness and value. We are happy to report that Mr. W. B. Hibbard, of Salt Lake City, and Mr. C. H. Haskins, Superintendent of the Northwestern Telegraph Company, have recently signified their design to take an active interest in securing members in their respective regions. At the suggestion of the latter gentleman, Mr. F. B. Gibson, of St. Paul, is addressing the operators of Minnesota on the subject, while he personally gives his attention to Wisconsin. From these and other indications of good will on many hands, there is every reason to believe that nothing is now needed to render the Association fruitful and permanent but discreet counsels and loyalty to the sentiments upon which it was originally organized.

WILLIAM HOLMES, Sec.

The following addition to Section II of the By-Laws was proposed by Mr. Thos. P. Scully, of New York, and adopted:

"Any member desiring to withdraw from membership of this Association may do so by paying all indebtedness to the Association and receiving from the Secretary a certificate of withdrawal." Approved.

On motion of A. S. Brown:

Resolved, That delinquent members shall be eligible to renewed membership on payment of back dues to an amount not exceeding five dollars, and without other initiation fee. Approved.

The resolution, of course, contemplates that the status of health shall be satisfactory, as at the first, and so certified in due form.

Mr. A. S. Brown offered the following amendments to the Constitution:

"At the next and all following annual elections of officers of this Association, delegates from districts outside of the City of New York shall be entitled to cast as many votes as the number of members they represent, provided such delegates shall bring written evidence of their authority so to act. No person shall be allowed to act as delegate or representative of any district who is not himself a member of the district he represents." Approved.

On the motion of A. S. Brown:
Resolved, That in Section VIII of the By-Laws, after the word "Association," insert "audit all claims and accounts." Approved.

On motion of D. R. Downer:
Resolved, That the amount of the initiation fee be hereafter two dollars. Approved.

On motion of J. W. Tillinghast, of Buffalo:
Resolved, That during the fiscal year commencing November 11, 1874, the Reserve Fund shall be increased to \$5,000, and during each of the two following years the sum of \$2,500 shall be added, and that thereafter the minimum of the Reserved Fund shall be \$10,000. Provided, that in case of extraordinary death rate, the amount may be temporarily reduced by unanimous vote of the Executive Committee. Approved.

On motion of F. W. Jones, of Chicago:
Resolved, That the Executive Committee be enlarged to seven members. Approved.

The following officers were elected for the ensuing year:

Mr. James D. Reid, Treasurer; Mr. Wm. Holmes, Secretary.

EXECUTIVE COMMITTEE.

Messrs. J. M. Crowley, Augusta, Ga.; C. H. Summers, Chicago, Ill.; R. H. Rochester, D. R. Downer and A. S. Brown, New York.

Adjourned.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Departure of Mr. Albert L. Baker.—A Case in Point.

SAN FRANCISCO, CAL., Nov. 5.

TO THE EDITOR OF THE TELEGRAPHER.

"BAKER leaves to-day" passed so often from mouth to mouth in our office that I thought a few words in THE TELEGRAPHER would not be inappropriate. Two years and some months ago Mr. Albert L. Baker came to this coast, having been attracted hither by the patent medicine puffery about California. He leaves the telegraph business to-day to visit his parents in Michigan and remain with them all winter, to study scenery and other branches of painting. Every one who knows Mr. Baker telegraphically will be sorry to hear that he has left a profession in which he had no superior and few equals. He was one of those operators, now very seldom to be found, whose intelligence kept pace with his fingers—none of that illiterate, mechanical, commercial colleigeism characterized his work. It was done ably and with judgment. None of his associates ever found him other than a gentleman of the finest order. Quiet and unostentatious in demeanor, affable and polite to a degree, yet firm in upholding what he considered right, and ever ready to embrace the cause of justice. Hence, we find him a "private still" in the ranks; while men of less ability, less judgment, and a thousand times less principle have been raised above him. Why is this? Because it illustrates clearly (what has been so often agitated through the columns of THE TELEGRAPHER) that a man must not be a man to be promoted now. There are, however, a few exceptions. Had Mr. Baker been more of the "Uriah Heap," or Michael Feeney, and less of the gentleman that he is, I am confident that he would have occupied a high position in the Western Union telegraph service. I hope he will pardon me for making his case an example, but I may live my life over again before I would have a better case in which to show the fraternity that our profession is no profession—wholly unworthy of the name of profession. If fifteen years ago Mr. Baker had embarked in any other business, with the same natural endowments, and possessed the same ability therein as he does in telegraphing, I ask you where would he be to-day? Ask yourselves. Would he be leaving it after so long a period to learn another? or would he be allowed to leave by his employers without some substantial mark of their esteem for so able and so faithful a servant? Now, had Mr. Baker been a plug, a sneak, a liar and a two-faced hypocrite, willing to traffic on the faults of his honest but sometimes foolish associates, I am inclined to believe that after fifteen years' service, even in telegraphing, he would have at least been a kind of an assistant chief operator; but, preferring a manly, upright, honorable course and an untarnished name, he leaves us, and we are deeply grieved at his departure. He has made hosts of friends—real, honest, warm-hearted friends, who will ever be glad to hear of his prosperity—of which may bounteous heaven shower a plenitude upon him.

"We know your heart, good Albert,
We know your mind and will;
A greyhound ever at the start
To run for honor still."

And may you ever continue to do so, is the honest wish of one who found in you what was to be most admired in a man. Farewell.

FIAT JUSTITIA, RUAT CÆLUM.

Paterson, N. J., Operators.

IN THE WILDS OF NEW JERSEY, October 15.

TO THE EDITOR OF THE TELEGRAPHER.

I THINK in my last communication we left off with Mr. Colton, of the Broadway office of the Midland Railroad, at Paterson. In this office also we find Willie Fliteroft, "O," who, although but twelve years old, handles the key like an experienced operator. Willie is a brother of Mr. J. E. Fliteroft, who is agent at Wortendyke, N. J., but has his residence in Paterson. There is but one wire in the Paterson, Broadway, office, and, for its length, it is the busiest wire I ever saw.

Jumping into the Midland horse car we ride up to the York avenue station, where we find Mr. G. W. Post, "Q," who has his hands full in attending to the ticket business and telegraphing. This is the repeating office for the N. J. Midland Railway offices. Mr. Post has lately been off on a visit to Oswego, not forgetting to step off at Deckertown. George is a lady's man, and is noted for his attentions to the fair sex. He is also a great dog and bird fancier.

Here may also be found Mr. S. W. Harris, who is the agent, and also makes himself useful at the key occasionally when it is necessary. Mr. Harris is a Hackensack boy, but came to Paterson from Johnston, N. Y., and succeeds Mr. J. J. Demarest, who goes to the head office.

Having completed the inspection of the Midland offices we will travel back down town to the Western Union office, which has been left to the last, as I design to give it a more extended notice. That prince of good fellows Mr. Wm. D. Westcott, "W," is the manager of the Western Union Company here. He is well qualified for the position, and manages the business and the wires in an efficient and satisfactory manner. He has recently been *dimpled* to the prettiest young lady in Paterson—Miss Christie. They have my best wishes for their future prosperity and happiness. Mr. Westcott has taught both his book-keeper and a student to operate. The student, Mr. Elias Carpenter, "C," is an excellent young man, and has become quite an expert telegrapher, somewhat to the envy of the book-keeper, Mr. Jacob Van Kiper, who tries hard to "frite gerse" on that Newark wire. This is the only wire he dares to go on as yet, because it's annoying to have New York say "Go West" to him. Jake tries hard to get along, but is like some others, who want to get through in a hurry, and think they know it all, while they have yet much to learn. He will, however, come out all right after sufficient practice on that old brass camel back key.

There are two messengers in this office who eye the instruments with suspicion. There are four wires running into this office, with as many sets of instruments and tables. Manager Westcott can pride himself on a good office and good location. The business of the office amounts to about \$700 per month, which is between \$100 and \$200 less than before the panic of last fall.

Of the wires in Paterson three are Midland, one Del., Lackawanna and Western, ten Erie Railroad, and I don't know how many fire alarm wires.

The fire alarm sounds every day at one o'clock, P. M., and an enterprising jeweller on Main street is out in on the W. U. wires to New York every week day at noon by Mr. Westcott, so as to receive the standard time.

Hoping that I have done justice to all, I will close this communication. My next will give an account of the D. L. and W. (Boonton branch). Operators, look out for P's. and Q's.

A New Theory of Electricity.

Professor EBLUND, a Swedish physicist, expounds in a recent work a new theory of electricity, the substance of which is as follows: He supposes the existence of a highly subtle and elastic ether, everywhere present both *in vacuo* and in ponderable matter. Two molecules of this ether are mutually repelled along the line of their connection and in inverse ratio to the squares of the distances. In good conductors the molecules are displaced easily from point to point, it being presumed that they can be moved with little force. If the body be a non-conductor, this mobility is arrested and depends on the molecules of the material body. A molecule is at rest from the moment when it is equally repelled on all sides. If the repulsion be less at one side than at the other the body will move if it be free in the direction of the resulting forces.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, NOVEMBER 21, 1874.

THE TELEGRAPHER:

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Automatic Telegraphy not Inimical to the Interests of the Telegraphic Fraternity.

THE impression has obtained to some extent among the telegraphic fraternity that the general introduction of automatic telegraphy would be likely to diminish the demand for skilled telegraphic labor, and thus affect unfavorably their interests. For this impression some of the advocates and promoters of the automatic telegraph system are to a certain degree responsible. It has been urged as an argument in favor of the system that such would be the case, and that certain portions of the work was so simple that even a child of ordinary intelligence could perform it, and that most of it could be done by a class of labor relatively much cheaper than that now engaged in telegraphic service.

Any person who has attentively read THE TELEGRAPHER during the last four or five years will bear witness that no such argument or statement has been editorially endorsed in its columns. We do not regard it as substantially correct, nor do we believe that the interests of telegraphers would be unfavorably affected by the general introduction of automatic telegraphy.

The chief advantage to be derived from automatic telegraphy, and the way in which it is to be utilized in the reduction of the cost of telegraphic service, is in increasing very largely the capacity of telegraph lines for the transmission of business. It has been well said by Mr. ORTON, in his official reports to the Western Union Telegraph Company, that the demand for telegraphic service increases so rapidly that it has become a serious problem how this demand was to be met without such a constant addition to the wires as is not only difficult to be made, but which seriously diminishes the profits to be derived from the business. The duplex has for a time met this demand with that company, and they are now striving to still further solve the problem with the quadruplex. It can, however, in our opinion only be fully solved by the automatic system, and this will eventually become a leading telegraph system in this country.

To work the automatic system efficiently skilled telegraphic labor will be required, whatever may be said to the contrary by either friends or foes. The reduction of cost will naturally and inevitably increase very largely the amount of telegraphic business done, and this will necessitate the employment in the various branches of the service of as many or more persons as are now engaged in it.

The proportion of skilled operators required, and the rates of compensation, will be as great as at the present time. Another point which should be borne in mind is that we have never claimed or advanced the idea that the automatic, pure and simple, would be likely to become the telegraphic system of the future. The best conditions will no doubt be obtained by a com-

bination of the automatic and other systems in the working of telegraph lines. This, we have always believed, would ultimately be the plan adopted, and have so stated repeatedly. It is not probable in any event that our Morse or printing telegraph operators are likely to be reduced to the dire necessity of abandoning their profession, or that they will be forced to accept starvation compensation, any more than they would be otherwise, even if automatic telegraphy were generally introduced upon American telegraph lines. The attempt to make it appear otherwise is mischievous, and usually is resorted to for sinister and unfriendly purposes and motives.

The history of other inventions and business, however, shows that even if it were true that the introduction of the automatic system, if it possesses the merits and advantages claimed for it, would enable the substitution of cheap for more expensive skilled labor, that that would not ultimately prevent such introduction and general use, whether THE TELEGRAPHER and other telegraphic journals advocated or opposed it. In no instance on record, however violent, forcible and persistent has been the opposition of those who supposed themselves interested in preventing the use of labor saving or economical inventions, has it been permanently successful. If certain work can be done for fifty cents, the public will not permanently pay a dollar for it, even if, by the reduction, individuals are injuriously affected. This is a law as immutable as that which governs the planetary system, and those who shut their eyes to the fact are no wiser than the foolish bird who merely hides his head and believes that because he cannot see the enemy the enemy cannot see him. When the public is fully convinced that automatic telegraphy is what its friends and advocates claim it to be, despite opposition of interested or ignorant parties, whether telegraphers or others, it will take the position to which its merits and advantages entitle it.

Quarrels and lawsuits over the ownership of patents may postpone this for a time, but these must eventually be settled or decided, and when they are the means will be provided for bringing the best automatic system, as a whole, into general use.

We seek to advance the interests of telegraphers and the telegraphic profession not by flattering or deceiving them, but by telling them the truth and keeping them informed in regard to matters in which they are interested. We have no personal interests or aims to serve in advocating, or otherwise, automatic or any other telegraphic system, for we have not personally a dollar invested in either of them. Independence in this as in all other telegraphic matters is our aim, and we propose to treat of all such as in our opinion they merit.

The New Law in Regard to Postage on Newspapers.

UNDER the provisions of the new postal law passed at the last session of Congress, on and after January 1st, 1874, publishers are required to prepay the postage on newspapers and other periodicals sent to subscribers. The fact that a paper is transmitted through the mails will, therefore, after that date, be sufficient evidence that the postage on it has been paid, and no postage can legally be collected of the party to whom it is addressed.

Although this necessarily adds to the expense of publication, we have decided not to increase the price of THE TELEGRAPHER, which will remain as heretofore at TWO DOLLARS per annum, and rely upon increased circulation to recompense us for the additional outlay required. We trust that our friends will bear this in mind, and will endeavor to secure such an addition to the number of our subscribers as shall prove that not only is the fact of prepayment of postage, but also the acknowledged merits of THE TELEGRAPHER, and its position as the only recognized independent telegraphic journal and representative of the telegraphic profession in the country, appreciated. The prepayment of postage makes the net cost to subscribers only two

dollars a year, which, for a weekly publication of the size and character of THE TELEGRAPHER cannot certainly be deemed excessive.

It will not be necessary, hereafter, for subscribers in Canada and other North American British Provinces to remit the additional twenty cents for postage, heretofore required to prepay United States postage. Our friends and agents in these provinces will please bear this fact in mind in procuring and forwarding subscriptions to us.

Our New Advertisements.

As will be seen, advertisers have this week occupied our columns to a larger extent than usual. The demands of advertisers for room increases so steadily that it seems likely that we may be compelled to enlarge THE TELEGRAPHER at no distant day, in order to give our readers a fair show. We have for some time contemplated such an enlargement, but for certain reasons of a personal nature, have not been able to make it, or fix a definite time when it could be done. The pressure not only of advertisements but also of telegraphic and electrical matters is constantly increasing and demanding more space than can now be afforded. The telegraph increases in importance and extent rapidly, and naturally requires more space for proper presentation and consideration.

In the present number Messrs. L. G. TILLOTSON & Co. have taken two columns, in addition to their regular advertisements, in which to call attention to their Railroad Sounder, which is recommended highly to those who may have occasion to purchase and use such an instrument. These may be obtained either at their New York establishment, No. 8 Dey street, or their New Philadelphia branch, 54 South Fourth, corner of Chestnut street, or at 22 West Fourth street, Cincinnati, Ohio. The honorable record and established reputation of this house from many years' business is a sufficient guarantee of honest and fair dealing. The name of L. G. TILLOTSON has been a household word amongst telegraphers and telegraph managers for the last ten or fifteen years.

MESSRS. LENNET & DECKER, of Cleveland, Ohio, also avail themselves of our columns to show purchasers of telegraph apparatus how to economize. And Messrs. SHERMAN & LYMAN, of Oberlin, Ohio, also advertise a complete stock of telegraphic goods. It is evident that the value of THE TELEGRAPHER as an advertising medium is generally appreciated by manufacturers and dealers in electrical and telegraphic apparatus and supplies.

The Metallic or Lead Battery.

THE rapidly increasing demand for the metallic or lead battery (commonly known in this country as the Eagles metallic battery), introduced by Messrs. F. L. POPE & Co., and which is still manufactured and sold by them, demonstrates the fact that its merits and advantages are becoming generally known and appreciated. It is undoubtedly the best battery for telegraphic and most other purposes for which galvanic batteries are required, offered to the public. It is economical, and from its peculiar combination of elements, will work for months after being set up without renewal or attention, either on open or closed circuit.

This battery can be obtained either from the manufacturers, Messrs. F. L. POPE & Co., or from Messrs. L. G. TILLOTSON & Co., of this city, who are agents for its sale.

Personals.

Mr. E. M. FOX, Manager Third District American District Telegraph Co., has resigned, and accepted a position on the staff of the *New York Herald*.

Mr. J. B. McDONALD has been appointed to fill the vacancy as Manager of the Third District A. D. T. Co., caused by the resignation of Mr. E. M. Fox.

Mr. E. V. ELLIOTT, formerly Manager of the Tenth and Fifteenth Districts of the Amn. District Telg. Co., has been appointed Supt. of the Amn. Dist. Telg. Co., at Jersey City, N. J.

Mr. JAMES NEWELL has accepted a position as reporter in the Stock Exchange with the Gold and Stock Telegraph Co., New York.

Mr. M. B. MEDLER has accepted a position in the Marine News Department of the Gold and Stock Telegraph Co., New York.

The Telegraph.

The Southern and Atlantic Telegraph Company.

BUSINESS on the lines of the Southern and Atlantic Telegraph Company, so far as completed, is reported as much improved, and now very good. The construction of the line South is proceeding in spite of the obstacles thrown in the way by parties interested in opposing the building of a competing Southern line, and the extension to New Orleans cannot much longer be delayed.

The American District Telegraph Company.

THE off force of Messengers of the American District Telegraph Company, about 200 in number, will parade from the Thirty-eighth District to Grand street ferry, and assemble at Myrtle Avenue Park, Brooklyn, for various exercises, on Thanksgiving day. A number of valuable presents have been provided.

An Offer to Lease the Franklin Telegraph Lines.

AN offer of \$35,000 a year on a lease of the lines, etc., of the Franklin Telegraph Company, was made on Friday of last week by Boston capitalists, who are interested in the lines. The offer was made by them mainly in consequence of an effort made at a recent stockholders' meeting by the Atlantic and Pacific Telegraph Company, who own a controlling interest in the stock, to lease the property of the company to themselves for \$25,000 per year.

As the company at its recent meeting adopted a resolution to lease the property to the Atlantic and Pacific Company, it is difficult to understand how the above proposition, even if made in good faith, can be available.

The American Fire Alarm Telegraph in Pawtucket, R. I.

THE following account of the completion of the Fire Alarm Telegraph at Pawtucket, Rhode Island, which has been put up by Messrs. Gamewell & Co., is from the *Providence Journal*:

"The final test of the fire alarm telegraph was made on Saturday. Dr. Munroe, the contractor for putting up the telegraph, was present to witness the trial, and see that everything was in complete order before its acceptance by the authorities of the town. The work of putting up the telegraph has been done under the direction of Mr. James Wilkinson, superintendent of construction. There are thirty-four boxes from which alarms may be given, eight of which are private, to be used only when a fire occurs on the premises or the property of the owners is in danger. Everything connected with the alarm is of the latest improvement. The battery is an improved kind, which it is claimed will run a year without replenishing. The boxes are provided with an improvement whereby but one alarm can be sent over the wires at one time. Should an alarm be pulled while another is being sent, over the wires, the box last pulled would not strike its number, but would run down and have to be pulled after the other had finished striking, in order to get an alarm from the box last pulled.

At the trial Saturday all the boxes were pulled and everything was found to be correct. Chief Engineer Greene, of Providence, and several other out-of-town firemen were present to witness the test: quite a number of our citizens were also present and had the working of the apparatus explained to them. We are informed that Pawtucket is the first town in the United States that has adopted the fire alarm system—in every other instance it has been a city government before a fire alarm has become one of the necessities of the place.

Mr. Wilkinson and some of his assistants departed for Nashville, Tenn., Saturday evening, where they are to erect a fire alarm telegraph."

Foreign Telegraphic Notes.

THE Hamburg steamer *Vandalia* picked up the Colon telegraph cable on the 4th inst., in the port of Panama, and caused it some slight damage, but not sufficient to seriously interrupt the business of the line. The necessary repairs were speedily made, and messages were soon being received and forwarded as usual.

The recent stormy weather in Great Britain not only affected seriously the land lines in the postal telegraph

system, but the submarine lines as well—there having been three cables, the Channel Islands, the Isle of Wight and the Isles of Arran, broken.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended Oct. 31, 1874, was 330,428—an increase of 44,569 on the corresponding week last year.

The Columbian, C. A., Government has made a contract which, if ratified in London, will secure to that country a submarine cable between Aspinwall, Cartagena, Savanilla and Santa Martha. The Government is to give an annual subsidy of \$25,000 for eight years. The Government has also agreed to give the company which undertakes it an annual subsidy of \$10,000 to maintain telegraphic communication between Panama and Peru, touching at Buenaventura.

The traffic receipts of the Direct Spanish Telegraph Company for the month of October amounted to £1,386.

The Indian Government land lines, which were interrupted by the cyclone have been repaired and messages are again being forwarded from Calcutta, via Suez and Falmouth, with regularity.

The traffic receipts for the month of October of the Eastern Extension, Australasia and China Telegraph Company, amounted to £16,584—a decrease of £1,002 on the corresponding month of 1873.

The traffic receipts of the Eastern Telegraph Company for the month of October last, amounted to £32,853—an increase of £3,624 on the corresponding month of 1873.

Presentation to J. A. Noble.

ON the night of Sept. 30th a pleasant party met in the parlors of the McMeeken House in Topeka, Kansas, and presented Mr. J. A. Noble, who has resigned the position of train master and despatcher, which he had held for three years past on the Kansas Pacific Railroad, to accept the position of Division Supt. of the Texas Pacific Railway, with a handsome gold watch and chain.

Telegraphing Extraordinary.

WE have heard much of the wonders of cable telegraphy in outrunning time and annihilating space, but an anecdote related to us by Mr. W. P. Phillips, assistant agent of the State Associated Press in New York, who is on a visit to this city, surpasses anything we have ever heard.

A gentleman of the Western Union Telegraph office at No. 145 Broadway, New York, was sitting in the cable room when a telegram from Philadelphia destined for Paris came over the wires. This message, like all others for France, was to go over the cable via Duxbury, Mass. The operator called Duxbury a few times, and then said: "That fellow is asleep, evidently; but the cable men are always awake—I'll have to get one of them to go in and wake him up." So he stepped to another desk, called Plaister Cove, in Newfoundland, and sent the following message: "To cable operator, Duxbury: Please go in and wake up my own true love." This message Plaister Cove hastened to send across the ocean to Valencia, Ireland, who in turn "rushed" it to London; thence it was hurried to Paris, and still onward to the European end of the French cable at St. Pierre; the operator there flashing it back to Duxbury. In less than two minutes by the clock the message had accomplished its journey of some 8,000 miles by land and sea, as was evidenced by the clicking of the instrument on the Duxbury desk, which ticked out in a manner a little more petulant: "That is a nice way to do; go ahead. Your own true love!"—*Troy Whig*.

The New Postmaster General and the Telegraph.

POSTMASTER GENERAL JEWELL is now engaged in the preparation of his annual report. It has been stated that he is opposed to the proposed postal telegraph system. This assertion is premature, as he has not determined what position he will take on the subject. The system has succeeded in other countries, and it might be successful here, but there are circumstances, he thinks, which makes the acquisition of established lines a matter of doubtful wisdom, and the construction of new ones would be unadvisable. As to the subject of postal savings banks, the Postmaster General does not seem to favor such an aggressive movement on the banking and financial institutions of the people. These subjects will not, it is likely, be treated in the report. The receipts and expenditures, and internal administration of the Department, will be considered at length. The Postmaster General is evidently amazed at the seven million deficiency this year—the expenditure of thirty-two millions against receipts of twenty-five millions. He will recommend either retrenchment in expenses or increase in postage. He thinks there are extravagances in many branches,

which he will endeavor to suggest remedies for. The Postmaster General, it should be understood, does not advocate high rates of postage. He does not believe in attempting a revenue from this source, but he does think that it is poor financing of the Government to make up such large deficiencies. If a reduction of expenses will cover the excess this would be preferred, but as the cost of transportation is constantly going up, it cannot be seen how much aid can be expected from that quarter. The report will be one of unusual interest and importance, as it strikes out on a new path.—*Washington (D. C.) Chronicle*.

[From the London, Ont., *Free Press*.]

Fire Alarm Telegraph.

THIS very important work, which is to be used as an auxiliary in connection with the proposed change in the working of the Fire Brigade, is being pushed vigorously forward by Mr. George MacDonald, the contractor. The poles and wires are nearly all up. The instruments are being tested in the manufactory of Mr. E. Chanteloupe, in Montreal, and will be in operation in less than a fortnight from now. This evinces an enterprise that few cities in America can boast of.—*Ottawa Times*.

It is certainly very enterprising; but we do not see why London should be outstripped in this particular. The proposed Fire Alarm Telegraph is popular enough here. No class of our citizens would begrudge the necessary outlay, deeming the advantage gained a good equivalent therefor. It only remains for our civic representatives to take the matter up in the right spirit to enable London to make the same boast as Ottawa.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

NOV.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.	GOLD AND STOCK.
12	79½ ... 80	19½ ... 20	Bid asked, ... 40	Bid asked, 60 ... 75
13	79½ ... 80½	19½ ... 19¾	... 42	60 ... 70
14	80 ... 80½	19½ ... 19¾	... 40	60 ... 70
16	80½ ... 81	19 ... 20	38 ... 42	60 ... 70
17	80½ ... 81	19½ ... 20	38 ... 42	60 ... 70
18	80 ... 80½	19 ... 20	38 ... 42	60 ... 70

New Patents.

For the week ended Oct. 13, and bearing that date.

155,936.—TUBES FOR UNDERGROUND TELEGRAPH LINES. Townsend Fell, Bristol, Pa. Filed May 9, 1873.

In the tube a series of disks are placed at suitable intervals, connected by a central hub or rod. The wires are supported and held in place by the notches in the disks.

The combination of tubes A of non-conducting material, and a series of internal notched disks, arranged at intervals so as to support a series of wires throughout their entire length, as set forth.

155,940.—WATCHMAN'S ELECTRICAL TIME RECORDERS. E. T. Gilliland, Cincinnati, Ohio, assignor to himself and C. Seiden. Filed June 26, 1873.

Clock dial rotated by clock work, and marked on by a pencil vibrated by an armature placed between two sets of magnets in branch circuits from one battery. Switches are interposed to close and break the branch circuits, closing one as the other is broken, the closing, however, of either being incomplete until the other is completely broken, necessitating a visit to each post to complete the record.

The combination, in a watchman's time register, having two sets of magnets with an interposed armature operating the marking mechanism of the two circuits B B', each connected to one pole of the battery at one end, and to different magnets at the other, and the switches g g, arranged to break circuit through one and close circuit through the other set of magnets the closing of the one circuit being incomplete until the last switch of the series be manipulated, all substantially as and for the purpose specified.

Married.

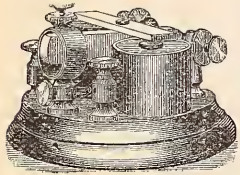
HOWDEN—READ.—At the residence of the bride's father, Louisiana, Mo., November 5th, Wm. J. HOWDEN, of London, England, and Miss MATILDA READ, of Louisiana.

Mr. Howden was formerly connected with the train despatcher's office at Bloomington, Ill., and for about one year has been the manager of the Western Union office at Louisiana, Mo.

This wedding was one of the most brilliant and enjoyable events of the season where it occurred, calling together about one hundred guests from among the friends of the groom and his beautiful and accomplished bride, many attending from a distance. The high position which the parties to this happy union hold in the esteem and affection of the whole people, and the rare beauty and virtues of the bride, gave zest to the enjoyments of the occasion, and secured many a "God bless you" from the assembled guests. Miss Read has long been the organist of the church, while Mr. Howden has been the efficient superintendent of the Sunday school. The bride was the recipient of many rare and beautiful gifts from partial friends, and the groom appeared in a complete wedding outfit of elegant fit, presented by his brother in London. His brothers will pass the word, "Well done," all along the line.

Send for their Price List before ORDERING ELSEWHERE
 Which they are selling at prices to ASTONISH YOU
 TELEGRAPH INSTRUMENTS
 HAVE A FIRST CLASS STOCK OF
 OBERLIN, OHIO,
 SO
 SHERMAN & LAMAN
 TELEGRAPHERS.

TAKE NOTICE!



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from,
LANNERT & DECKER,
 31 1/2 Prospect St., Cleveland, O.
 Send for circular.

PHILADELPHIA.

L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of
 TELEGRAPHIC AND ELECTRICAL GOODS
 of every description, at

No. 54 SOUTH FOURTH STREET,
 (Corner Chestnut street),
 PHILADELPHIA.

They solicit the patronage of their friends and the telegraphic fraternity generally.

WATTS & COMPANY,

No. 47 HOLIDAY STREET,
 BALTIMORE, MD.

SUPERIOR TELEGRAPH INSTRUMENTS, RELAYS, SOUNDERS, KEYS, OFFICE WIRE, BATTERIES OF EVERY DESCRIPTION, SWITCHES, GALVANOMETERS, RESISTANCE COILS.

A COMPLETE STOCK of EVERYTHING for the TELEGRAPH OFFICE or ELECTRICAL LABORATORY.

Special attention given to repairing Scientific Instruments. Several of our workmen having served their time in the most prominent European manufactories, enables us to guarantee satisfaction.

SEND FOR CATALOGUE AND PRICE LIST.

LECLANCHE BATTERIES.

IMPORTANT NOTICE.



After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,

No. 40 WEST EIGHTEENTH STREET;

or to

L. G. TILLOTSON & CO.,
 8 Dey street, sole Agents.

F. L. POPE & CO.,

MANUFACTURERS AND DEALERS
 IN

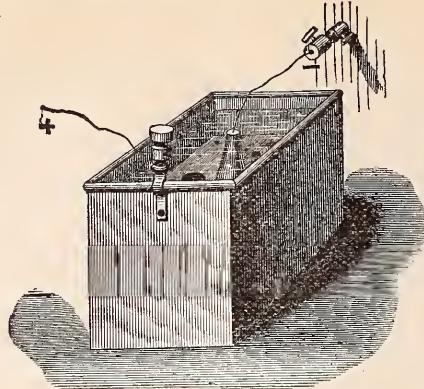
Telegraph Instruments and Supplies.

STANDARD TELEGRAPH INSTRUMENTS,
 EAGLES METALLIC BATTERY,
 NONPAREIL TELEGRAPH INSTRUMENT,
 INSULATED WIRE, etc., etc.

Send for Circular and Price List. Address,

38 VESEY STREET, NEW YORK.
 (P. O. Box 5503.)

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,

(P. O. Box 5503.) 38 VESEY STREET, N. Y.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with Iron, consists in its LIGHTNESS, relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.

ALANSON CARY, Treasurer,

No. 234 West 29th St.,
 New York.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

—:—:—

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.
Each additional word 1c.		Each add. word, 2 to 3 cents.	
UNIFORM TO ALL POINTS.		PROPORTIONATE TO ALL POINTS.	

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

SECOND HAND INSTRUMENTS.

A large lot of well polished and good working

RELAYS, REGISTERS AND CUT-OUTS,

GEO. H. BLISS & CO.,

41 Third Avenue, Chicago, Ill.

GEORGE H. BLISS & CO.,
 41 Third Avenue, Chicago, Ill.
 CINCINNATI, O., ST. LOUIS, MO.,
 Elm St., cor. 5th. 409 North Third St.
 Manufacturers and Dealers in

TELEGRAPH INSTRUMENTS AND SUPPLIES.

RELAYS, unequalled for beauty and strength;
 COMBINATION SETS; Box and Pocket RELAYS.

CHALLENGE, PONY and REPEATING SOUNDERS.

KEYS, various styles, including the SCHNEIDER KEY, just out, no legs, wire connections above the table.

REGISTERS, with SPRINGS or WEIGHT.

CUT OUTS, many varieties, including a new style of PEG CUT OUT, with an adjustable LIGHTNING ARRESTER, just out.

REPEATERS—HASKIN'S AUTOMATIC, and others.

SWITCH BOARDS—REPEATING, BATTERY and GROUND SWITCHES and LIGHTNING ARRESTERS.

ANDER'S GALVANIC and MAGNETO-ELECTRIC PRINTERS; also SELDEN PRINTER.

ELECTRIC BELLS, HOTEL ANUNCIATORS, FIRE and BURGLAR ALARMS, and WATCHMAN DETECTORS.

ELECTRIC RAILWAY SIGNALS and ALARMS, ELECTRIC GAS LIGHTING APPARATUS.

MEDICAL INSTRUMENTS and APPARATUS on hand and made to order. Second hand Instruments for sale cheap, and repairing done at short notice.

BATTERIES in great variety, including the latest inventions; also a full assortment of battery material.

WIRES—MOORE & SON'S and PHILLIPS' MAGNET and OFFICE WIRES, GUTTA PERCHA and KERTIE WIRES, BEST GALVANIZED LINE WIRES; SUBMARINE, SUBTERRANEAN and HOUSE CABLES.

INSULATORS—BROOKS, SCREW GLASS and KENOSHA CARBON.

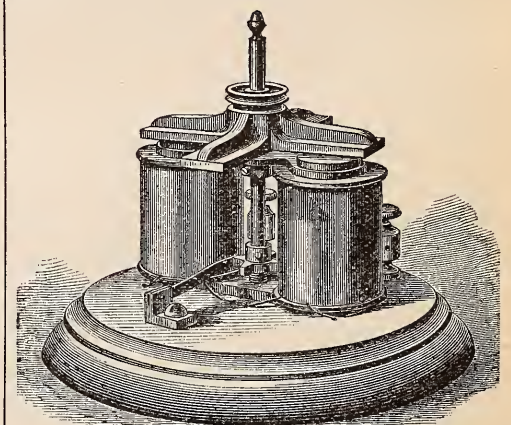
BRACKETS, PINS and SPIKES, TELEGRAPH POLES, LINE BUILDERS and REPAIRERS' TOOLS.

TELEGRAPH STATIONERY—REGISTER, MESSAGE and MANIFOLD PAPERS, CARBON SHEETS, STEEL and AGATE STYLUSES, ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK and AWL CLIP, STANDARD TELEGRAPH BOOKS, &c.

PRICE LISTS FURNISHED FREE ON APPLICATION.

Our TELEGRAPH INSTRUMENTS and ELECTRICAL APPARATUS are elegantly finished and mounted on highly polished rosewood, mahogany and walnut bases.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine

Run by Electricity!

It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery.....\$6 00
 " without Battery..... 4 00

May be seen working at the office of the THE TELEGRAPHER.

For sale by

The Electro-Magnetic Manufacturing Company,

36 BROAD STREET, NEW YORK.

P. O. Box 1894.

Also for sale by

L. G. TILLOTSON & CO., 8 Dey street.

F. L. POPE & CO., 38 Vesey street.

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SOUNDER.

RAILROAD
SOUNDER.

RAILROAD
SOUNDER.

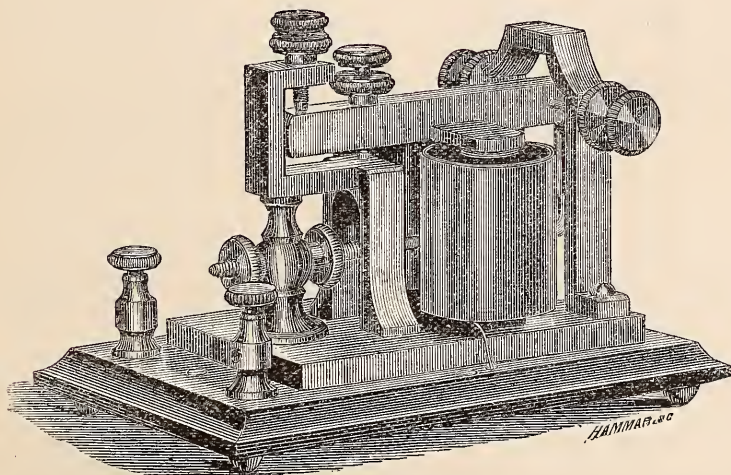
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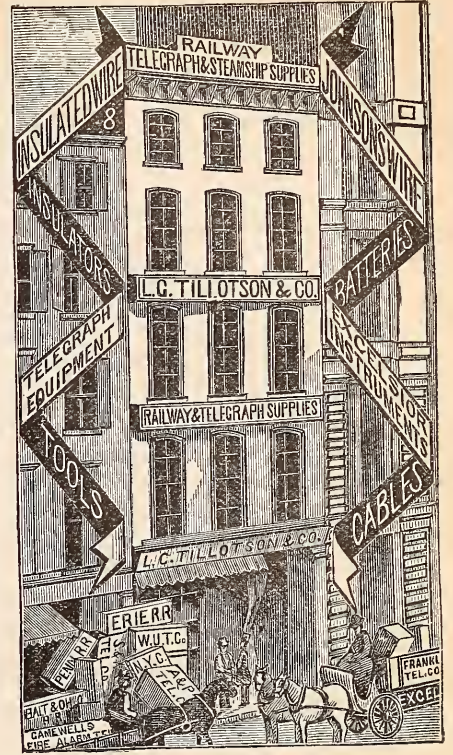
RAILROAD
SOUNDER.

RAILROAD
SOUNDER.

PRICE, \$7 50.

20 % DISCOUNT FROM LIST PRICE
ON ALL TELEGRAPH INSTRUMENTS.

L. G. TILLOTSON & CO.,
8 DEY STREET, N. Y.,
54 SOUTH FOURTH STREET, PHILADELPHIA,
22 WEST FOURTH STREET, CINCINNATI.



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**

and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,

Comprising Sounder and Key, is the greatest
success of the times.

L. G. TILLOTSON & CO.,

8 DEY STREET, NEW YORK,

54 SOUTH FOURTH STREET, PHILADELPHIA,
22 WEST FOURTH STREET, CINCINNATI.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent. discount from list prices on all
instruments of our manufacture.

L. G. TILLOTSON & CO.,
8 Dey Street, N. Y.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

J. R. DOWELL, Richmond, Va.,

Special Agent for Virginia and North Carolina.

J. A. BRENNER, Augusta, Ga.,

Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Alhany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and

their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

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BUNNELL'S PATENT REPEATER.

These Instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

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We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

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THE PATENT INSULATOR.

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Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
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These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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constructed in the best and most substantial manner, and on reasonable terms.

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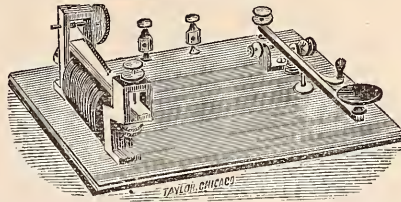
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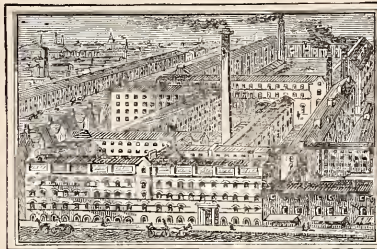
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A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,
 BY
TAL. P. SHAFFNER, LL. D.,

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This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

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VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

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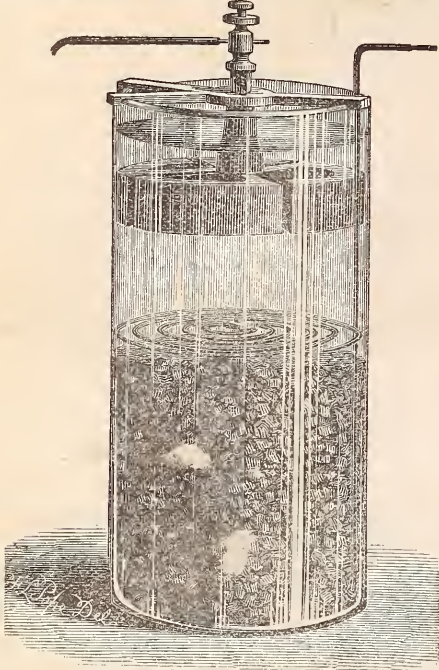
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter

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CLEANLINESS. CONSTANCY. ECONOMY.



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LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
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This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

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The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without ANY ATTENTION whatever. The copper and zinc solutions are perfectly separated, and there is

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and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a
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The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
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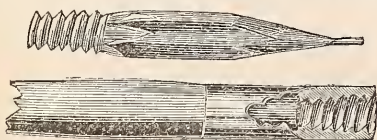
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This HOLDER is intended to save the last half or third of the pencil.

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When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

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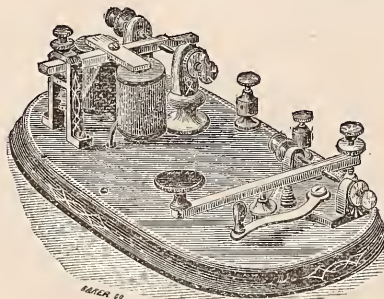
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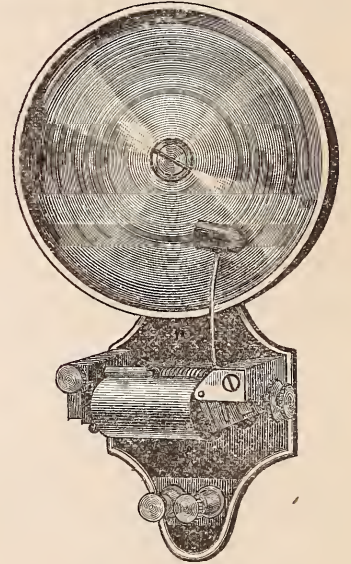
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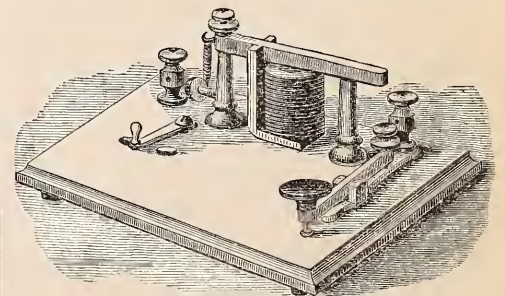
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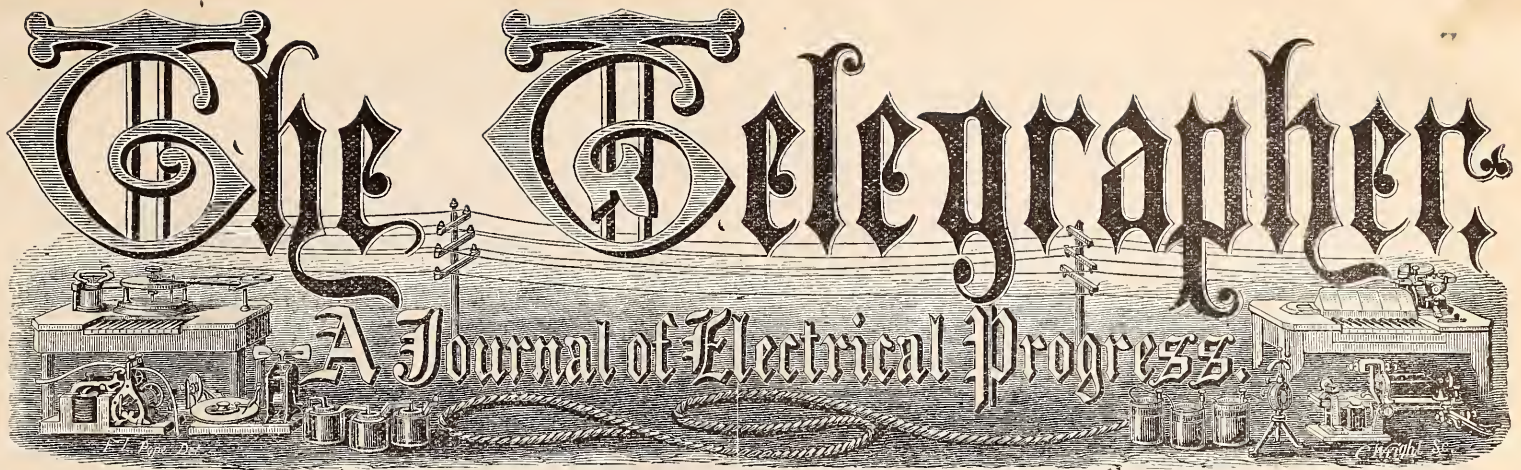
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, November 28, 1874.

Whole No. 437

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FURNISH ALL DESCRIPTIONS OF
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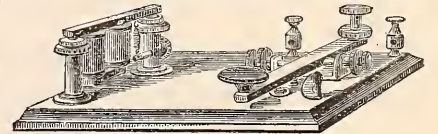
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FLEXIBLE CORDS, all kinds, &c., &c.
We warrant all Wire to be of the highest conductivity, tested by our Galvanometer, which compares with the tests of the highest authority in this country.

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This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.

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The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.

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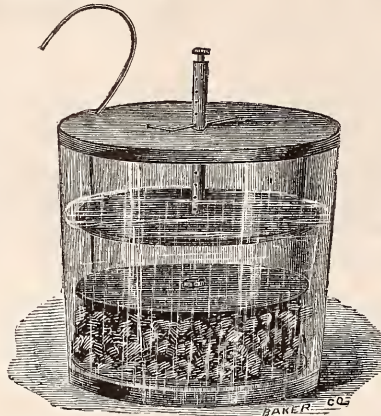
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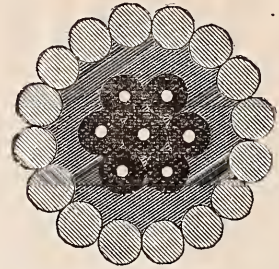
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, NOVEMBER 28, 1874.

VOL. X.

WHOLE No. 437.

Original Articles.

The American Electro-Chemical (Automatic) Telegraph System and Condensers.

TO PROFESSOR HENRY we are indebted for his very elaborate investigation (many years since) in relation to the effects of induced currents of electricity in variable coils or helices of wire. His experiments extended in so far as to develop alternate and counter currents in coils or helices up to the seventh order. Prof. Henry announced to the scientific world, in 1832, his important discovery. (See *Silliman's Journal*, July, 1832.)

Prof. Dal Negro, in 1833, discovered that iron cores augmented the power of the coils (see *Annali del Scienza*, March, 1833); as a consequence smaller helices could be used.

Prof. Faraday, in 1834, announced the same remarkable phenomena as previously discovered by the distinguished American scientist, Prof. Henry. (See *London and Edinburgh Philosophical Magazine*, November, 1833.)

Prof. Henry, in 1835, made his extended communication on the influence of a spiral conductor in increasing the intensity of electricity. (See proceedings of the American Philosophical Society, January, 1835.)

Prof. Fizeau discovered, in 1853, the action of the coil or helix when used as a condenser or accumulator in suddenly arresting, and absorbing after currents. (See *Comptes Rendus*, vol. 36, p. 420.)

The first application to the purposes of electro-chemical (automatic) telegraphy was made by myself on the 20th June, 1869. (See, also, extracts from my patents, as follows:—)

No. 108,496.—October 13, 1870. "Variable coils or helices in a branch or shunt circuit of an electro-chemical (automatic) telegraph. To clear the main line with much greater rapidity than the arrangements heretofore employed."

No. 2,286.—August 30, 1871. "Helices in a branch or shunt circuit of an electro-chemical (automatic) telegraph."

No. 125,527.—April 9, 1872. Electro-magnets in a branch or shunt circuit of an electro-chemical (automatic) telegraph.

No. 1,207.—April 22, 1872. Electro-magnets in a branch or shunt circuit of an electro-chemical (automatic) telegraph.

No. 131,171.—September 10, 1872. Adjustable or variable helices to regulate the relative force of branch or shunt circuits in an electro-chemical (automatic) telegraph.

Finally, its several junctions in connection with my electro-chemical (automatic) telegraph are as follows:

First, as an "overflow dam," by passing to earth excess of incoming waves of high potential. Second, in its adjustment of the decomposing force. Third, its use in preventing the total escape from the stylus of waves of low potential. Fourth, its use as a "condenser" or accumulator, by its sudden absorption of the lingering charge left in the branch or shunt circuit and stylus, or breaking the main line circuit by the intervention of the paper of the perforated telegraph at the transmitting station. Taking into consideration (in this case) its varied functions, I term the same my *Condenser Overflow Rheostat Dam*.

GEORGE LITTLE, C. E.,
Passaic City, New Jersey, U. S. A.

The Characteristics of Telegraphers and the Condition of Telegraphic Service.

BY OLD TELEGRAPHER.

IN the early days of the magnetic telegraph in this country the operators were essentially a migratory class, here to-day and gone to-morrow. They were then, as is to a considerable extent the case now, mostly young men, and usually without the domestic ties which made it necessary that they should have permanent settled places of residence. Most of them were always in light marching order, so to speak, and ready at a moment's notice to remove from one place to another,

and the distance between their temporary locations made but slight difference to them. They were at home wherever they chanced to stop for a shorter or longer period, and being usually jolly, happy-go-lucky individuals, were for the time contented, provided they were not required to remain too long in one place.

Although scarcely the ordinary lifetime of a generation has passed since the construction of the experimental line between Baltimore and Washington, many and radical changes have taken place in the characteristics of those engaged in telegraphic service. The rapid development of the telegraph business has necessitated more stringent discipline and supervision of the employés, and the looseness and lack of system in the administration of the telegraphs which were considered as at least not reprehensible, would not now be tolerated on any respectable or important telegraph line. The proportion of the telegraphic fraternity who drift about from place to place has steadily decreased, and the profession has come to be recognized as one in which the principles which govern the employés in any extensive and regular business must be applied. The advantage and importance of permanence in the main body of the employés of any telegraph company is recognized, and those in whom the gipsy element is strongly developed are not considered as the most desirable. Formerly, the fact that an operator did not remain for any considerable time in one place, but was ever looking out for "fresh fields and pastures new," was not regarded as seriously detrimental to his chances of obtaining employment; but this is not so now. The old condition of things applies more generally to railroad than to commercial telegraph lines and operators at the present time. This arises in part from the fact that, as a rule, railroad telegraph operators, who may almost be considered a class by themselves, are not as well paid as operators on commercial lines, and from the facility of transportation incident to their employment upon such lines. And even upon the more important railroad telegraph lines this characteristic is gradually being changed, and the necessity of employing a more reliable and responsible class of operators is coming to be more generally recognized. Many of the most intelligent and best qualified telegraphers are now engaged in the railroad telegraph service, and their number is constantly increasing. Such electricians and telegraphers as F. H. Tubbs, I. N. Miller, C. S. Jones, and others who might be named, who occupy prominent and responsible positions in the railroad telegraph service, would do honor to any telegraph line, and it would be for the advantage of railroad companies if they had a larger proportion of such talent in the conduct of that branch of their business. It has become a well recognized fact (outside of New England) that no railroad can be operated efficiently without the coöperation of a good telegraph system, specially employed and devoted primarily to the railroad service—and most important railroads, not located in New England, have a telegraph department which is part and parcel of its regular system. Day and night the telegraph operator is on duty and keeps ceaseless watch, and facilitates the passage, obviates delays, and guards against accidents the trains which traverse the iron rails continually. But few who are not engaged in railroad service have any idea of the vital importance and necessity of the telegraph in the safe and efficient management of that service. Such a service should employ the best possible material and compensate accordingly, and as railroad managers come to recognize this fact the character of their telegraphic employés will be improved and elevated.

It is unquestionably a drawback upon the telegraph service that in this country there is such facility for changing from one profession or business to another. The inducements held out by other pursuits are constantly depleting the telegraphic ranks, and usually take the better, more intelligent and efficient telegraphers from the service. Young men who engage in telegraphy with bright anticipations of future promotion and success, after a time become discouraged at the slow progress made, and are ready to abandon it for other occupations, which they believe promise more speedy and satisfactory results. The columns of THE TELEGRAPHER almost weekly contain the announcement of the resignation of telegraphers to "engage in other business." If by some means this could be prevented, it would, no doubt, prove advantageous to the service. It might be, to some extent, by a better system of classification of positions and of promotions as vacancies occur, but it is impossible at present, or to entirely remedy the evil. It is one which is not singular to the telegraphic service in this country, but is experienced in almost every business where skilled labor is employed, and is incident to the character of the country, its rapid development, and to our people, who are not content, as in older and more densely populated communities, to plod on year after year, and from youth to age, in one employment, when so many others hold out inducements to lure them into trying experiments, which they hope and believe will result in bettering their condition.

Year by year the telegraph is increasing its demand for employés, and where but a few years since hundreds sufficed to meet this requirement, thousands now find employment, and the telegraphers of the country already constitute a great army, whose numbers are constantly augmenting and must continue to augment for many years to come. It is then of the first importance that these persons who are necessarily intrusted with such vital interests should be worthy of the trust reposed in them, and should be reliable, intelligent, and properly trained for the discharge of their duties.

It is the interest not only of telegraph companies and the public, but also of the telegraphic fraternity themselves, to discourage the employment of the Bohemian class, who once constituted so considerable a portion of their number—good fellows, perhaps, in the main—but whose characteristics unfit them to be either creditable or advantageous to themselves, their employers or the profession which they have adopted, or into which they have drifted. The time, it is to be hoped, will come eventually, in which there shall be some standard of ability, qualification and character, which shall be recognized by telegraph managers and the fraternity, which shall regulate the employment and position of telegraphers. This might be and can only be effected by the cordial coöperation of telegraph employers and telegraphers themselves. Such a coöperation THE TELEGRAPHER has heretofore advocated, and it is to be hoped will continue to urge, however remote may seem the probability of its being adopted.

If the much talked of and written about telegraphic association could take this shape, and be inaugurated by the more reliable, cool headed and intelligent telegraphers of the country, it might be expected to effect something beneficial to all parties concerned. The fear on the part of telegraph employers that it might become a sort of trade union, and result in strikes and disarrangement of the relations between employers and employés, doubtless is the cause of their discouraging such an association or any association of telegraphers. This may be in time overcome, and it is to be hoped will be, and that, with an intelligent appreciation of the advantages to be derived, they may favor such an organization, which, representing the main body of employés, can deal authoritatively with the questions which are now in abeyance, and which ought to be definitely settled and arranged for their mutual benefit. Unless this can be done it is inevitable that in time another telegrapher's league will arise, and perhaps become more powerful and effective than that which was brought to an untimely end by the premature strike which has become historical.

Jack Allison.

BY O. H. KAY.

HAS "the gentle—" etc., ever travelled? "The gentle—" has! But do not answer too impulsively; consider what is asked. You may have been about a good deal and still never have travelled—that is, if you are a telegrapher. There is a difference in defining "travelled," as applied to the telegraph operator and to almost everybody else. For an operator to have travelled it is necessary that he should have been kicked out of Chicago (using a term of less eloquence than comprehensive expressiveness), watched the repeater at Memphis, taken report in New Orleans, stayed a little while in Omaha, and been in San Francisco, though not absolutely necessary that he should have worked in the latter place. Then, too, it will be found a great convenience to him, if he has read enough of Richardson, to be able to talk calmly of the "plains" and the hardships his fertile imagination can picture for one's endurance there.

Then you have never travelled? neither have I; nor neither has Jack Allison. Jack Allison is an old and very intimate friend of mine. But I say Jack has never travelled, notwithstanding he has made three voyages to Europe, and visited France, Spain, Egypt, Rome, the Holy Land, China, Australia and the Indies, besides skirmishing about the United States in every conceivable direction for three years, and having seen everything worth seeing. Jack is an operator, and before his grandmother died and left him pretty comfortably circumstanced, he used to work with me, but he has not worked any since. He simply goes around and has a good time generally, and then comes back periodically and tells me all about it. Still, I again repeat that Jack has never travelled; he has never "watched the repeater at Memphis," etc. When Jack gave up the key he did not give up his friendship for his old associates (very foolish of him, too), but he comes in just as slouchily, and throws himself in a chair and his great feet on the table just as familiarly, and tenders a segar just as generously as he ever did, and he is just as ready and as satisfied to tell yarns until midnight as he ever was. I say this is foolish of Jack. I will leave it to the reader if it is not preposterous. Wait till my grandmother dies, or my aunt or pet cousin, and lavish their hoarded shrek-

els upon me. I do not presume I shall remember my old acquaintances. I shall forget all my former social relations, and my previous existence, if possible, and remember only that I have lived in vagabond idleness and luxury. My friends shall be new ones, and of a higher order than Bill Darby and Nat Blinker, and those of that stripe. They shall comprise counts (and may be countesses), and princes (and perhaps their sisters), and major generals and brigadier generals, and captains—no, let's see—will I familiarize with captains? Well, leave that blank; but we will take the generals and their daughters, their wives and younger sisters and aspire even to royalty. Otherwise, though, I shall do just as Jack does. I shall roam about but never "travel."

And I will pause to say that I concur in my belief with the world, that a telegrapher knows nothing until he has travelled.

He is not educated, and sophistry is too foreign to him. I know just how contemptibly I would regard the inexperienced if I myself had been favored, and how I would glory at the know-nothingism of the balance of creation, and in the feeling of inexpressible meanness and comparative cheapness and worthlessness which my presence, and calm conversation of matters and things uncommon, would inspire in the minds of common operators. Jack is different from all this, but, as I remarked, Jack is foolish. He is insane, and thus it is that we get so much entertainment out of him, and love to see him come in and proffer the acenstomed segar. I have seen one or two other cases where sanity was less desirable than its opposite.

Jack never talks excitedly, nor even earnestly. He assumes more of a listless and disinterested mood, and while talking of one thing happening seems to be ruminating upon another. He told us the other evening of an eccentric character he met one morning, in the State of New Jersey, in the person of a night operator at a railroad station. Jack had gone very early in the morning to the station in question, to take the morning express, which train happened to be half an hour late. Approaching the window of the telegraph office, he saw its occupant, a man of perhaps twenty-two years of age, with his eyes but partially open, climbing down off a table where he had evidently been sleeping, and proceed to fold up three or four newspapers which he had spread upon it, after which he put them carefully away in a drawer, locking the same.

Jack approached him with "Well, how have you rested?" "O, pretty fair last night—a good deal better than usual," he replied, turning around as he finished to see who had addressed him; and then, after a quizzical glance, he continued off-handedly, "You see, I had a better bed last night than I get sometimes—mattresses the boys call them. Anyhow, there's a big lot of difference whether you have all *Tribunes* or the whole lot is *Christian Unions*, or you make your bed out of a quadruple sheet edition of the *Herald*, or whether you mix these all up and get your head, maybe, and your left ear on an execution in the *Herald* and a piece of your body on THE TELEGRAPHER, and part of your legs and one foot on the *Christian at Work* and the other foot on the *Scientific American*—the foot with the tender corn, too—and then have other literature and trash of all sorts strewn about under you promiscuously. Yes, indeed, big difference. It mixes up things and disturbs one's dreams somehow, besides it don't lay nowise comfortable. Now, the very best kind of a bed and the most comfortable is when you can get two or three of our papers—THE TELEGRAPHER. That seems to rest me the best of anything I ever got a hold of. I just subscribed for it last week, and haven't got enough to go all under me yet, so I splice out with *Christian Unions*. That comes next to it. It was a good while before I came to realize that it did make a difference that way. I used to be troubled with awful dreams and vicious of plugs. You don't know what plugs are—oh, do you? Maybe, then, you are an operator?"

"Ah! well, come in. There, sit down. I was going to say I used to dream about plng factories and all that, and get mixed up on some of the infernal scientific problems—machines for sending three ways at a time, and enabling one man to send fourteen messages all at once, with the same key. I say I used to see phantoms, or ghostly skeletons, which suggested these things, but never brought anything into tangible shape, and I always awoke from a confounded nightmare after the goblins had pranced around long enough and mixed up all my ideas, so that it would require half an hour to straighten them. Well, this run along for a week, and I was growing frantic. I got to sitting up in my chair, until I happened one night to be blessed with an idea. I always used to spread out two or three *Journals of the Telegraph* to keep from soiling my clothes (slept on a bench outside then), and I just thought to myself I would change; so that night I put down a couple of copies of the *Hawkinsville Times*, and I slept better and dreamed about agriculture and pumpkin pies and patent hen coops. So after

that I never used any *Journals*, but I have experimented with everything else with more or less satisfaction, until I happened to borrow some back numbers of THE TELEGRAPHER down at Slimmersville, a month ago. I found that was just what every honest telegrapher wants to sleep on. My dreams are pleasant and peaceful, and Fisher, down at Ux, swears he can't raise me in all night.

"But I found something worse than the *Journal* a spell ago. They sent us a little sheet called *The Operator*, and Blummer, the day operator, subscribed for it six months, and after he had accumulated enough I made a raid one night and thought I'd try them. Well, I can't describe what it was like, only I didn't get over it for two days. I seemed to have little mustachios sprouting out all over my face, and I was whirled in a giddy maze of frivolous and silly nonsensicalities, with neither point nor application, until I lost all reckoning, and in kicking about for something solid and substantial I kicked myself off on the floor, for which I was thankful anyhow. I don't want any more *Operator* for me; but so long as I can get TELEGRAPHERS I don't care if Ux never raises me, for (confidingly) they only give me thirty-five dollars a month here."

Jack said he heard the locomotive whistle, and he bid his odd and newly made friend adieu; and then, as he always was, Jack was reminded of an incident which occurred once in India just like this, and so he began talking about the natives, and a row he and a chum named Spriggings kicked up in camp once; and so kept diverting further and wider until I should be afraid to tell anything that followed as being in keeping, or appropriate to tell in connection with this sketch.

The Great American Telegraph Traveller.

BY CENTRIPETAL.

THE Morse operator of the old school was an inveterate traveller. The facilities for obtaining passes in those "good old days," and the necessity for sending out teachers to "break in" new recruits, were among the causes which instilled this roving disposition into the pioneers of the profession.

A tonr of the country years ago was something of a triumphal march, for in those days the telegraph was more of a wonder than materialized spirits are at the present time. The advent of the telegraph operator was the sensation of the hour, even in towns so large that the first incumbent experienced some difficulty in ascertaining the address of L. E. Phant, to whom his first message was very probably addressed.

Free drinks, free grub, and free rides were an every day affair, and when the novelty of the new institution wore off, and the hero descended to the level of common mortals, very likely he thought the proper time had arrived for him to "dig out."

If some of the natives, in the innocence of their hearts, had allowed him credit for a new suit, or permitted his wash bill to assume gigantic proportions, his anxiety to seek new quarters increased as the end of the month approached, at which time he had probably remarked that his check would come. It was not to be supposed that a man who was entrusted with the responsibility of manager, would be guilty of so base an act as to close his office and leave for parts unknown without pausing a few moments to bid his friends "good bye." The brief notice hastily scrawled on a blank and pasted on the door, to the effect that the operator had gone out to fix the wire and would return before night, would have been considered "too thin" by bash vendors of the present day. The good deacon, who carefully adjusted his "specs" and perused the placard, would not believe for a moment but that his boarder would return in due season. His faith weakened as time elapsed, and the succeeding manager, having heard the story of his predecessor, did not deem it wise to apply for board at the same place.

Although the proportion of these birds of passage, as compared with the whole fraternity, may have diminished, many of the telegraphic fraternity are still an unsettled part of the community. There are some who still contrive to "bilk" their creditors, and that cases of this kind are no more plenty is owing fully as much to the growth of acuteness in the citizen as of honesty in the migratory telegrapher.

Laying aside the baser motives for change, there may be found other reasons, usually left unexplained, which have no little bearing upon the average operator. His life is often a continual grind, and he would not perhaps object to the work, were it not for the enforced confinement, which he imagines to be steadily gnawing at his vitals, and causes him to sigh for shorter hours, or, in the language of the worldly, "a soft thing."

Notwithstanding this feeling his love for the almighty dollar will not permit him to forego the opportunity to "scoop" in an extra whenever a chance is open. When he tears away from his old haunts he often goes it blind, but within a few years circumstances have changed, and he now uses more caution in shifting his base. If he has been many years in one place and a

good operator, he knows that in securing a new position he must submit to a reduction of 10 or 15 per cent., so at the present time a man feels like hanging on to a good thing until he sees something better within his grasp. This growing stability might easily be encouraged by employers, if some judicious system of promotion could be established. It is as true to day as in the olden time, that "a prophet is not without honor save in his own country," and often a young man grows up in an office, patiently waiting for some one to die or resign, until discouraged in his expectations he goes West, sometimes for the better, but just as often for the worse. The "opposition" was at one time a popular resort for the discontented, but a few years' experience has shown that this is too often a leap from the frying pan into the fire. Inferior or irregular pay, bad wires, long hours and hard work, soon cool the ardor of the young man who sets out with the intention of bucking against the monopoly.

The earliest ambition of the young American is to see the world, and if he is determined to do this before he dies, it may be best that he should start on his expedition early in life. Impressions upon the youthful mind are more enduring, and his responsibilities are less; and the telegrapher who has thoroughly learned his trade, is perhaps as sure of a job that will at least give him a living as a member of any other craft. We can hope for no change in the latter characteristic, even if it were desirable.

Boys will be boys, and the mantle of kite flying and ball playing will descend from generation to generation in the future, as in the past, and so long as the telegrapher can "raise the wind" or "beat his way," he will still remain "The Great American Traveller."

Lectures by Professor Trowbridge at the Lowell Institute, Boston.

THE second lecture of the course before the Lowell Institute, Boston, on Electricity and its Modern Practical Applications, was given on Friday evening, November 20, by Professor J. Trowbridge, of Harvard University. In his first lecture Professor Trowbridge, referring to the characteristics of modern science, said that perhaps the most important of them was exact measurement. The advances in electrical science, though very great, were not striking to the casual observer. The successful operation of the Atlantic cable, and the modern methods of correcting the variation of the compass in iron ships, were due to the use of knowledge gained by exact measurement. A second marked feature was the advance in the methods of minute measurement, of which the use of the mirror, as in the reflecting galvanometer, was an example. The lecturer also referred to the determination of the mechanical equivalent of heat, and the development of the molecular theory as a third direction in which great advances had also been made.

In his second lecture Professor Trowbridge said that he should treat first of dynamic electricity instead of static, which, although contrary to the usual order of arrangement, was, in many respects, more convenient and perhaps more logical. The manner in which two kinds of electricity, or, as he preferred to say, two opposite electrical conditions, were produced, was explained and illustrated. The first discovery in relation to dynamic electricity was made by Volta in 1800. He discovered that if two plates or discs of different metals were pressed together, that they assumed opposite electrical conditions, and he soon after found that the interposition of moistened paper between the plates increased the effect. The arrangement was soon still further improved by placing the two plates of metal in a cell of liquid, which is substantially the Voltaic battery of to-day. The next advance was made by Ersted, of Copenhagen, who discovered that a suspended magnet was deflected from its normal position by the passage of an electric current in its immediate vicinity. Shortly afterwards Arago constructed the electro-magnet, in which a bar of soft iron was rendered magnetic by the passage of the electric current through a wire coiled heliacally around it. Subsequently, and almost simultaneously, Steinheil and Cook, in Europe, and Morse in our own country, invented the electric telegraph. The present century, therefore, may be termed the century of electricity. It has witnessed a complete revolution in our methods of conveying intelligence.

In order that the phenomena of electricity may be manifested, two things are necessary—a means of generating the electricity and a means of conveying it—or, in other words, a battery and a conductor. The electro-motive force of a battery might perhaps be understood by comparing it to a vertical standpipe or tower filled with water, from the bottom of which a stream issued with a force due to the pressure or head of water in the standpipe. If by some means water was forced up to the top of the tower in sufficient quantity to maintain its level, notwithstanding the outflow at the bottom, as, for example, by a steam pump, this pump might be compared to the electro-

motive force of a battery, which maintains a constant difference of electrical condition, called tension, between the two opposite poles or plates of a battery, which causes a current of electricity to flow. By means of an oxyhydrogen lantern the image of a transparent galvanometer dial and its needle was projected upon the screen. The deflection of the needle by the passage of the current through a neighboring conducting wire was shown in a very striking manner. The decomposition of water into its elements, oxygen and hydrogen, by means of the voltometer, was shown on the screen in a similar manner, illustrating the chemical effects of the voltaic current. The manner in which heat is produced by the voltaic current was next shown by turning a fine steel wire in a vessel filled with oxygen gas, producing a brilliant light. Another very striking illustration of the same effect consisted in connecting two horizontal parallel copper strips, about two feet long and an inch apart, with the opposite poles of a powerful battery, and placing a brass ball upon them, so as to complete the circuit between the strips. The expansion of the strips caused by the heating of the metal at the points of contact with the ball, owing to the flow of the current, caused the ball to oscillate, and finally to roll back and forth through a distance of a foot or more. In conclusion the lecturer illustrated the magnetic influence of the current by means of a hollow helix, having a soft iron rod within it. The lines of magnetic force, discovered by Faraday, were beautifully and strikingly shown by means of iron filings sprinkled upon a sheet of glass, the whole being projected upon the screen in full view of the audience. The effect of a bar magnet was first shown, and then that of a conducting wire conveying an electric current, the analogous action in the two instances being at once apparent. The lecture was attended by a large and appreciative audience.

The Camacho Electro-motor.

SEVERAL scientific men at Havana have been appointed to examine the electro-magnetic engine invented by J. S. Camacho, and to report on its advantages for industrial purposes in general, and especially as motive power. So says the *Revista de Telegrafos*. In the Camacho electro-magnet each limb is formed of four hollow concentric iron cylinders, the inner one half an inch in thickness, and the three remaining one quarter inch. The interior diameters of the tubes are, respectively, 2, 3, 4 and 5 inches. Each of them is surrounded with a coil of copper wire, covered with cotton, and is one eighth inch in section, forming, on the three inner tubes, two complete layers with 180 turns, and on the outer tube seven layers with 630 turns.

The copper wire on each tube is coiled in the same direction, passing at its ends across the armature of the magnet, and uniting them, therefore, in the natural order, so as to form a single conductor through which the current from the battery may travel, magnetizing each tube, and endowing them all with magnetism of an equal nature. The length of the limbs of the magnet is 8 inches, the weight 77 lbs., and that of the copper wire 47 lbs., with a total length of 2,600 feet.

Repeated experiments have shown that this magnet requires the current produced by seven bichromate of potassa elements, and its power of attraction at a distance of one twelfth of an inch is more than 1,250 lbs. An electro-magnet of the ordinary construction, of equal exterior diameter, and placed in the same conditions, is only able to support 25 lbs.—a weight of 50 times smaller.

Repeated experiments of physicists as eminent and well versed in electro-magnetism as De la Rive, have shown that the main difficulty which has opposed the industrial application of the electro-magnetic force has been that hitherto it has proved from 25 to 30 times dearer than that of steam. If, therefore, M. Camacho has succeeded in obtaining electro-magnets so powerful, the following proposition cannot be pronounced too venturesome: "The new electro-magnets offer to industry a source of power much cheaper than animal labor, and capable of immediate application to urban railways. The same power is further destined, at no remote epoch, to replace advantageously that of steam."

The report is signed by D. Francisco Clerch, Professor of Physics and Chemistry at the College of Guanabacoa; D. En. de Aianlave, Inspector General of Telegraphs for Cuba; D. Antonio de Molina, Engineer in Chief on the staff of the roads, canals and harbors, and of public works; and D. Alberto de Castro, Civil Engineer.

Curiosities of the Telegraph.

THE readers of a daily newspaper do not, as a general thing, sympathize with those luckless journalists whose duty it is to grope through the tedious intricacies of the telegraph despatches and arrange them for the inspection and delectation of the critical

reader; and it is for the purpose of demonstrating in what a hopelessly confused shape the telegrams sometimes drop from the nimble wires that we copy the following despatch from an exchange. Those who have gnashed their teeth, and tore their hair, and raved over the unintelligibility of midnight telegrams will shed a tear just here, while the general public will wonder at the unusual occurrence related, or accept it with the bland confidence of innocence. This telegram is dated New Orleans, 21st:

"Gen. Store, of Bawron, a foreigner, was gutted by a mob on March 5th, and has sued the city for \$31,000 damages."

Referring to the *Republican* of Thursday, we find a despatch from New Orleans to the effect that the "Gun store of Bouron, a foreigner," having been gutted, etc. —*Lynchburg Paper*.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Fast Telegraphy and the Interests of the Telegraphic Fraternity.

TO THE EDITOR OF THE TELEGRAPHER.

WITH your permission I will make a few remarks in reference to your editorial of the 21st inst., on the fact that automatic telegraphy is not inimical to the interests of the telegraphic fraternity. In the course of your very pertinent remarks in regard to the impression that has obtained to some extent among telegraphers, that the general introduction of automatic telegraphy would be likely to diminish the demand for skilled telegraphic labor, and thus affect unfavorably the interests of practical telegraphers, you say, "For this impression some of the advocates and promoters of the automatic telegraph system are to a certain degree responsible." Now, I hope you did not intend to include me as one responsible for this impression, after the firm stand you know I have ever taken from the first day of the introduction of my American automatic telegraph system, in regard to the imperative necessity that always must exist for the employment of the best operative talent as aids to the (in the future) leading telegraphic system in this country.

You truly say, "The reduction of cost will naturally and inevitably increase very largely the amount of telegraph business done, and this will necessitate the employment in the various branches of the service of fully as many persons as are now engaged in it. The proportion of skilled operatives required, and the rates of compensation, will be as great as at the present time."

We shall indeed be no wiser, figuratively speaking, than "the foolish bird who merely hides his head, and believes that because he cannot see the enemy the enemy cannot see him," if we overlook the fact that for telegraph or any other service the public will not pay a dollar for what can be supplied for a less sum; "a law as immutable as that which governs the planetary system." GEORGE LITTLE, C. E.
Passaic City, N. J., Nov. 23, 1874.

Delaware, Lackawanna and Western Railway (Boonton Branch) Telegraphers.

IN THE WILDS OF NEW JERSEY, Oct. 30.

TO THE EDITOR OF THE TELEGRAPHER.

IT will be more of a task for me to write up this line than those previously attended to, as I am not very well acquainted with the operators employed upon it, but will try to do them justice, nevertheless. I am under obligations to Mr. Morris Bixby for information, and also to Mr. Tinsman, operator at Paterson, for similar favors.

On this branch there is but one wire, which extends from Hoboken to Dover, New Jersey. The Supt. and Chief Train Despatcher's office is located at Hoboken. In this office we find the Chief Operator, Mr. F. W. Coolbaugh, "C." He is not perhaps quite as pleasant a gentleman as might be desired, which is probably owing to his arduous duties, but he keeps things moving lively on the line. He has for his first assistant Mr. F. Bristol, "F," who is in some respects like his superior officer. The third assistant, Mr. J. M. Dalrymple, "D," is a very young gentleman, and quite the opposite of his two superiors.

Leaving Hoboken, we pass on through the Erie tunnel, under the Midland and Montclair roads, to the Meadows, where we leave the Morris and Essex division, and go on the Boonton Branch. The first stop is at Bergen Siding, "B. S." At the office Mr. M. Bristol, "B," officiates as day operator, and Mr. C. T. Borland, "R," as night man. They are both very

pleasant young gentlemen, and do not seem to have been unfavorably affected even by being obliged to stick it out all alone on the meadows.

We next stop at Kingsland, "K." At this place the company are following the example of the Penn. R. R. Co. in the erection of monstrous shops and engine houses. In the office Mr. E. T. Galloway, "G," who is a very accommodating and pleasant gentleman, attends to the telegraphic interests of the road without assistance.

Continuing our journey we next reach Passaic, the residence of Mr. George Little, the well known electrician, and inventor of the American automatic telegraph system. The telegraphing here is done by Mr. H. S. Dean, "N."

At Paterson, which is next reached, is Mr. S. J. Tinsman; at West Paterson, Mr. B. K. Van Norwich and Mr. C. Koch, who have been mentioned in my previous letter on Paterson operators, and it is not therefore necessary to give them more than a passing mention at this time.

We next reach Suiquack, "Sy," where may be found Mr. S. H. Garris, "G," and Mr. S. E. Lamourax, "Z." At Lincoln Park, "B. N," may be found Mr. R. A. Crater, "R. N," and Mr. R. Lillybridge, "R. A," on hand for telegraphic business; and at Martville we are greeted by Mr. J. S. Strunk, "S," and Mr. W. J. Davis, "X."

Our next stop is made at Denville, which is noted for its camp meetings and pretty young ladies. Mr. P. H. Crane, "C," officiates telegraphically here during the day; and at night is relieved from duty by Mr. E. M. Smith, "S." The latter is represented to be a nobby sort of fellow, and as given to flirting with the city girls who come out from New York to pass the summer in this part of the country.

Not being able to learn the names of the Western Union operators at Boonton, we will pass on, without further remark, to the terminus of the road and line, Dover, "P," where Mr. George Raymond "Ra," holds forth as day operator, and Mr. John H. Hulshizer, "H," as night man. They are both very pleasant and accommodating young men, but have their hands full in attending to both the main line and Boonton branch wire.

Hoping that I have so far done justice to the telegraphers who have come within my observation and notice, I will close this communication. Look out for my next.
P'S AND Q'S.

Bereaved Telegraphic Artists.

CALIFORNIA, Nov. 12th.

TO THE EDITOR OF THE TELEGRAPHER.

IT was a long time before the citizens of Sacramento became enterprising (?) enough to build and maintain a city telegraph line, but at last two or three of the most energetic young men of that city concluded to try this herculean task, and as to how they have succeeded I will leave it to the large number of perspiring operators under their control to say, and I am sure their answer will be, "they have done nobly; for are we not all to be successful candidates for lucrative positions on some one of the telegraph lines in this State?"

Not long since the monotony and dulness of their working with men exclusively was relieved by the appearance on the line of one destined to create a flutter in the breast of more than one masculine Morse manipulator. The fair student signed "S."

Things were red hot for some time on the "peanut." Business had never been so lively there before. His office was well represented, there being three day men and one owl, who kept the local buzzing all the time, to the almost entire exclusion of the students who paid dues. The boys in H hadn't paid any, as the "Superintendent," looking favorably upon their efforts to advance his telegraphic subjects in the ways and mysteries of the "art," had, in his magnanimity, declined to charge them the customary dues. X and Q each purchased a pocket edition of Webster, and tried their best, by the use of large words, to entice the young lady into the belief that they were A 1 in the telegraphic business. Q, the owl, might be seen approaching the office regularly every day at 5 P. M., one hour before his time on duty, so that he could have a pleasant chat with the dashing female before commencing his telegraphing in earnest.

But at last their fun came to an abrupt termination, for on "B" calling "S" one morning he received no response but the echo of his attempts to rival "Q" in rapid calling. Next day the sad news that "S" had departed for some watering place was gently wafted over the line.

Now, if you want to see a lot of sad eyed young men, step into the office at the depot and inquire for "O," "B," "Nd," "R," "S," of H.
SUTRO.

THE TELEGRAPHER is no ephemeral affair, but a well established and permanently successful independent telegraphic journal.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

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Special Notice.

FROM and after January 1st, 1875, the United States postage on THE TELEGRAPHER will be prepaid by the publisher. Notwithstanding the additional expense the price of subscription will remain as heretofore, Two Dollars per annum, payable in advance.

Hereafter it will not be necessary for subscribers in the British North American provinces to remit the additional twenty cents heretofore required for the prepayment of the United States postage.

The New Postmaster General and the Telegraphs.

SINCE entering upon the duties of his office our new Postmaster General, Mr. JEWELL, has been actively engaged in investigations into the affairs of the Post-office department, with a view to instituting such reforms as are needed to render it more efficient and economical. Himself a successful business man, he manifests a disposition to introduce into the management of his department the rules and principles which would govern him in conducting it if it were a private enterprise of his own instead of a great political institution, as has hitherto been the case. He finds that the revenues of the department for the last fiscal year show an excess of expenditures over receipts of some seven millions of dollars, and that this deficit, which has to be made good from the general treasury, is annually increasing. As a business man he considers such a condition of the business contrary to good business management, and the problem which he is attempting to solve is how it can be remedied. There are apparently but two ways in which this can be done, the first by increasing the rates of postage and thus obtaining additional revenue, the other by decreasing expenses. While he does not consider that the Post-office should be a source of revenue to the Government, he does think that in some way it should be made to defray its own cost, and not be a financial burden upon the Treasury.

We are not advised as to what recommendations he will make to Congress in his first annual report, which is to be presented at the session that commences on the first Monday of December next, to effect an equalization of the receipts and expenditures, but are confident that they will be eminently sensible and practical.

His predecessor, Mr. CRESWELL, never seemed to be in the least troubled by the rapidly increasing deficit in his department, but rather the reverse, and inclined to advocate schemes which should augment the deficit more rapidly. But then it must be remembered that he was not a business man, but a politician and a lawyer, and naturally regarded it as more desirable to add to the power and importance of his department than to make it self-supporting. To this end he persistently urged upon Congress the adoption of the scheme of adding the telegraphs of the country to the legitimate postal business, and also desired to secure the transfer of the business of the Savings Banks of the country, as an additional branch of the public service under the management of the Post-office department. He, however, failed to secure Congressional approval of either, and was finally compelled to abandon the office without realizing his desires in regard to either of his pet projects.

In selecting his successor the President appears to have acted wisely, and so far as can be judged from the brief time which has elapsed since he entered upon the duties of his office, Mr. JEWELL is the right man in the right place, and is likely to make a model Postmaster General.

In regard to the question of a postal or Government monopoly of the telegraphs, the new Postmaster General, when interviewed on the subject, which he has been repeatedly, has been rather non-committal, alleging that he has not yet had time to fully examine into the matter, and that until he has thus carefully inves-

tigated, it he will not, privately or officially, assume any position either for or against it. It is evident, however, that until the legitimate business of the Post-office can be made self-supporting, he does not favor entering upon any new and doubtful experiments in a pecuniary point of view. As Mr. JEWELL has himself been a practical telegrapher, he can judge better upon matters connected with telegraphs than one who, like his predecessor, only theoretically understood them, and depended upon his assistants and others, who had axes to grind in the adoption of a Government telegraph monopoly, for his statistics (which were repeatedly shown to be entirely unreliable), and his arguments based upon them. As the President has repeatedly endorsed in his official communications the postal telegraph scheme, and urged its adoption upon Congress, it would not perhaps be becoming in the Postmaster General to strenuously oppose it, but he certainly is under no obligation to lend his official and personal influence, as Mr. CRESWELL did, to induce Congress to adopt and carry out the idea, regardless of the cost and the additional burden upon the public treasury.

From such information as we have been able to obtain we are confident that in the coming session of Congress the Government telegraph monopoly scheme will lack the aid which it has hitherto received from the Postmaster-General, and doubt whether any very serious attempt will be made to carry the project. The change in the political complexion of the next House of Representatives is also unfavorable to the scheme, and would probably defeat it in any event, even if it had had before a better show of success. This is the last session of the present Congress, and the short session, expiring on the fourth of March next, and as it is to be succeeded by a House of an opposite political character, there will be too much other business and matters of moment requiring attention to permit of much time being devoted to the postal telegraph. It will no doubt be passed over to the incoming Congress, which does not meet for a year to come, and it is scarcely necessary as yet to discuss the question "What will they do with it?"

Those who have been so urgent in advocating a Government telegraph monopoly for this country are likely in future to lack the support hitherto derived from the Post-office department, and to find that however rich and generous Uncle Sam may be, it will be considered a sufficient evidence of his wealth and generosity to assist in paying for the transportation of the mail matter of his numerous relatives and dependents without being additionally burdened with a considerable percentage of their telegraphic expenses as well.

In the interests of the public, the telegraphs and the telegraphic fraternity, and of the Government, THE TELEGRAPHER has steadily combatted the postal telegraph projects of every description, and we may be pardoned some satisfaction at finding that most of those even who originally differed from us on the subject are now convinced that we were right.

The Holiday Season.

THE holiday season has once more come round, and we hope that telegraphers as well as others will be able to enjoy the customary festivities of the season. Thanksgiving Day, which, originating in New England, has become a national holiday, has just passed, and Christmas and New Years are at hand, when we are expected to close the old year and inaugurate the new with festivities, mutual good will and wishes and rejoicings. This is the season of gifts and presentations to friends and relatives, and it is sometimes difficult to decide what these shall consist of. To telegraphers no gift can be more appropriate or better appreciated than that of a year's subscription to THE TELEGRAPHER. It will every week during the coming year bring to the recipient of such a gift the remembrance of the kindness of the giver. It will be a double benefit and token of good will—to the friend who receives it and to the publisher, whose subscription list is increased thereby.

For ourselves, we ask no better Christmas or New Year's remembrance than a new list of subscribers, and those who may desire to aid and cheer us in our labors, are requested to bear this in mind, and exert themselves accordingly. Now is the time to commence making up your lists, and we hope and expect that our Christmas and New Years will be made merry and happy by such notable additions to our readers and subscribers as shall excel that of any previous year. No telegrapher should be without the weekly visits of his paper, THE TELEGRAPHER. It is no temporary or trumpery affair, but an established and successful journal, almost in its teens, but we trust very far from its dotage.

The Atlantic and Pacific Telegraph Company.—Executive Changes.

FOR some time past reports of changes in the executive of the Atlantic and Pacific Telegraph Company have been current, and we have ascertained the facts in the matter, which are as follows: About three weeks since Mr. JOHN DUFF, the President of the company, sold all of its stock which he held, and resigned the presidency and his position as one of the trustees, and is consequently no longer interested in or connected with it in any way. As yet there has been no election of a President to succeed him, there having been no meeting of the trustees since Mr. DUFF's resignation was made. In the meantime the Vice-president, Mr. WM. H. GUYON, is, *ex officio*, acting President. Mr. L. P. MORTON, a trustee, and one of the executive committee, has also resigned, and is no longer connected with the company.

At the annual meeting of the Western Union Telegraph Company, held October 14th, Mr. MORTON was elected a director of the Western Union Telegraph Company, and as he could not well serve two companies engaged in active competition with each other, his acceptance of the latter position, of course, involved his retirement from his former connection with the Atlantic and Pacific Company.

These changes are undoubtedly favorable to the future of the Atlantic and Pacific as a competing telegraph company. It will be recollected that rumors and reports have been circulated, from time to time, that the Atlantic and Pacific Company was either already under the control of the Western Union interest or was to be absorbed by that company at an early day. There was, undoubtedly, a scheme arranged to effect this, but we know that this has been defeated, and that the position of the Atlantic and Pacific, as the leading company competing with the Western Union for the telegraph business of the country, has been assured and strengthened, and that the changes in the executive of the company indicate the success of the efforts to prevent its being thus turned over to its competitor.

We make this statement on the best possible authority, and to explain exactly the position occupied by the company, and reassure those who have been in doubt as to its actual and present status. The recent advance in the price of its stock is the result of this settlement, and of the favorable character of its business, and the contracts and arrangements which have been made for the future. The business of the company is constantly increasing, and is larger for the last two months than ever before in its history, and its prospects for the future are encouraging.

The Direct United States Cable Fleet.

THE Direct United States Cable fleet, comprising the Faraday, Dacia and Ambassador, were, on the 12th instant, at Harbor Grace, Newfoundland, waiting for suitable weather to complete the laying of the cable. As nothing has been heard from them since up to the time this is written, it is to be presumed that the weather has continued to be unfavorable for the purpose. It is still hoped that the work may be completed this season, but as the Atlantic at this season is seldom in a congenial mood for cable laying, this

hope grows fainter as time passes. The contractors and officers of the fleet show good pluck in adhering to their purpose of completing the work, but it is to be feared that notwithstanding only about 200 miles of the cable remain to be laid, the task will be found impossible. We are assured, however, that whatever can be done will be to effect the purpose, and until the attempt is definitely abandoned shall continue to hope for the best.

The Telegraphers' Mutual Benefit Association.—A Liberal Contribution to its Reserve Fund.

WE have been furnished with a copy of the following official communication of President ORTON, on behalf of the Western Union Telegraph Company, to Mr. JAMES D. REID, Treasurer of the Telegraphers' Mutual Benefit Association, making, on behalf of the company, a contribution of \$1,000 to the Reserve Fund of the association.

This liberal action on the part of Mr. ORTON and the Executive Committee of the company will, doubtless, be fully appreciated by the members of the association, and will materially aid in increasing the fund to \$5,000, as provided by the action of the association at its recent annual meeting.

EXECUTIVE OFFICE, WESTERN UNION TELE-
GRAPH COMPANY, NEW YORK, Nov. 21, 1874. }

JAMES D. REID, Esq., Treasurer, etc.

Dear Sir—I regret that I was unable to attend the annual meeting of the Telegraphers' Mutual Benefit Association, and I hope my absence was not construed as indicating indifference on my part to the objects of the association. I have read the published accounts of the proceedings, and have also conversed with some of those who attended the meeting, and I take the liberty to say that I cordially approve all that was done.

And now, in testimony of my desire to increase the usefulness of the association, by encouraging present members to continue the good work, and others to come to their assistance, I have the pleasure to contribute to the Reserve Fund of the association the sum of \$1,000, which has been placed at my disposal by the unanimous vote of the Executive Committee.

I am, very respectfully, etc.,

WILLIAM ORTON, President.

The Approaching Session of Congress.

A WEEK from Monday next the present Congress will assemble for its last session. Although this is a short session, lasting but three months altogether, it is not probable that much important business will be done until after the Christmas and New Year's holidays. We do not expect that anything definite will be done at this session in regard to the telegraph schemes, for the reasons which have been stated in another article, but our readers will be fully informed in regard to all matters of telegraphic interest which may transpire in Congress or at Washington during this session.

It will be a melancholy session in some respects, especially for the House of Representatives, for an unusually large number of members will, on the fourth of March next, leave the Capitol to return to it no more for two years at least, as members. They will have the satisfaction in retiring to private life, whether temporarily or permanently, of knowing that as regards the telegraph they are guiltless of having sacrificed it by consigning it to official and political management, as they have been so persistently importuned and urged to do.

A Journalistic Nuisance.

MOST of our readers have no doubt seen a very insignificant cur, inflated with an overweening idea of its own importance, vociferously barking and alternately snapping and snarling at the heels of some larger and more dignified member of the canine race, who treated his Lilliputian adversary with the disdain to which its insignificance entitled it. Such a cur is unquestionably a nuisance, but it is impossible that it should be considered in the light of an adversary worthy of being seriously regarded.

Those of our friends who have been solicitous that we should notice the personalities and attacks of a certain *nondescript* publication, will understand from the above why we refrain from doing so. The young men who are its nominal publishers and editors are no doubt personally very decent and respectable individuals, but if they permit such fellows as now evidently control its columns to make it a sewer for the discharge of their mental and personal filth, they must as journalists be judged by their course in that respect.

The American District Telegraph Company Volunteers.

WE are under obligation for an invitation to attend the first annual target excursion of the American District Telegraph Company Volunteers, which came off at Myrtle Avenue Park, Brooklyn, on Thanksgiving Day. Previous engagements prevented our attendance, but the excursion was a very pleasant one, and very much enjoyed by all who were present.

The company is composed of the messengers of the American District Telegraph Company, all of whom not on duty participated in the excursion.

A bountiful Thanksgiving dinner was served at the Park for the Volunteers and their guests, which was heartily appreciated and enjoyed.

Champion Burglar Alarm and Annunciator.

THE attention of telegraph managers and operators is called to the advertisement of the CHAMPION BURGULAR ALARM AND ANNUNCIATOR COMPANY, which will be found in our advertising columns.

The Burglar Alarms and Annunciators of this company were awarded the *first premium* at the recent Fair of the American Institute in this city. Liberal inducements are offered to telegraph managers and operators to act as agents of the company in securing the introduction of these alarms and annunciators into private houses, hotels, etc.

Personals.

MR. JOHN W. GALBRAITH has resigned his situation as Manager of the Dominion Telegraph, at Guelph, Ont., Canada.

MR. A. BURROWS has been appointed Manager of the Guelph, Ont., office of the Dominion Telegraph Co., *vice* Mr. GALBRAITH, resigned.

MR. AUGUSTUS L. HECKLER, who so ably represented the New York Associated Press at Long Branch, N. J., during the last season, has accepted a position as reporter in the Stock Exchange with the Manhattan Quotation Telegraph Company, New York.

The Telegraph.

By Cable.

THE DIRECT UNITED STATES CABLE REPORTS FROM THE FARADAY.

LONDON, Nov. 25th.—A despatch from the cable steamer Faraday, dated yesterday, says operations were delayed by unfavorable weather.

Another despatch, dated to-day, says the gale is not abating. We shall buoy the cable. Depth of water, 834 fathoms.

Preparations for the Direct United States Cable.

A NEWS despatch from Portsmouth, N. H., of Wednesday last, states that Mr. Oliphant, of the Direct United States Cable Company, was there awaiting the arrival of the steamship Faraday at Torbay, in order to make a final completion of the enterprise.

Plans have been prepared and proposals issued for a building for a cable station two stories high. In addition to the operating rooms there will be accommodation for the manager and some of the principal electricians. The building is to be completed by January 15th.

THE chief difficulty met with in acquiring scientific knowledge consists not so much in failing to comprehend language as in failing to grasp ideas.—*W. H. Precca.*

Are Earthquakes an Electrical Phenomenon?

REFERRING to the account of the singular freaks of lightning upon the house of Mr. E. W. B. Canning, at Stockbridge, printed by the *Republican* last summer, a San Francisco electrical engineer writes as follows concerning some interesting phenomena connected with the California earthquakes: You may, perhaps, be aware that until very recently we have been very free from any manifestations of atmospheric electricity, but have every year had some three or four earthquakes of more or less damaging nature, usually occurring in the fall of the year—October being the most favored month. At periods of about three years these earthquakes have become rather alarming in their violence, and on more than one occasion have completely demolished buildings. The damage in San Francisco has been in many instances the most severe along the lines of the street car tracks, and the last heavy one experienced apparently followed up the line of the Alameda Railroad, and at its terminus completely turned the railroad station around without throwing it down, and entirely demolished a grain warehouse adjoining—the shock being most severe at this point of any place in the State. Since the completion of the Central Pacific Railroad we have had no shake up sufficiently severe to notice, but the October of the year of its completion an earthquake shook you up all over New England. The question now arises, Are not earthquakes an electrical phenomenon? Professor Noad, in his excellent work, "Student's Text-book of Electricity," advances a great many excellent points to prove that such is the case, and my own observations seem to tend that way. We have had earthquakes in the State since the railroad's completion, but they were far removed from any iron railroads. Do not the roads act as gigantic lightning rods, equalizing the electrical tensions in various parts of the country?—*Springfield Republican*.

THERE is no mode so effectual to impress ideas on the mind as that of experiment aided by reflection.

Obituary.

ISAAC BUTTS.

A DESPATCH from Rochester, N. Y., on Friday, Nov. 20th, announced the death, after a painful illness of two weeks, of Mr. Isaac Butts, a prominent and worthy citizen of that place, and at one time well known in telegraphic circles. He was twenty-two or three years ago connected with the telegraph interest as one of the Rochester party who originated what is now known as the Western Union Telegraph Company. He, however, disposed of his telegraph interests many years since, and realized handsomely upon them. He was one of the original promoters of the House Printing Telegraph Lines, and was prominently connected with the New York and Buffalo, and the Mississippi Valley Printing Telegraph Companies, until they were sold out to and consolidated with the Morse lines. Subsequently, he started the Rochester *Union and Advertiser* newspaper, and was connected with its management for several years. Afterwards he engaged in the paper manufacturing business. Mr. Butts was a shrewd and enterprising business man, and was usually successful in his business ventures, and accumulated a large fortune.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

NOV.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.	GOLD AND STOCK.
19	80 ... 80%	...	...	...
20	79% ... 80	19% ... 20	...	...
21	79% ... 80	19% ... 19%	...	...
23	79% ... 80%	19% ... 19%	...	...
24	80% ... 80%	19% ... 19%	...	...
25	80% ... 80%	...	...	...

New Patents.

For the week ended November 3, 1874, and bearing that date.

156,560.—ELECTRO-THERMOSTATIC FIRE ALARMS. Edward J. Frost, Philadelphia, Pa., assignor of one half to J. Haehulen, same place. Filed September 4, 1874.

Constantly closed main line through signal apparatus; a thermostat normally keeping closed a shunt to the magnet of the signal apparatus, rendering the same inactive till the shunt be broken by the action of heat on the thermostat, when, the current being obliged to traverse the circuit through the magnet, it releases the signal mechanism.

1. The thermostat, consisting of the U tube with ball A, in which a partial vacuum is created, and mercury balance, substantially as described.

2. The combination, with the thermostat described, of a conductor, H, the series of conductors D D' D', and switch F, substantially as and for the purpose set forth.

3. The combination, with a closed main line circuit and an electro-magnet placed therein, and controlling a signal or alarm mechanism, of a shunt circuit normally closed and controlled by a thermostat, substantially as and for the purpose set forth.

4. The combination, with a closed main line circuit and an electro-magnet placed therein and controlling a signal or alarm mechanism, of a shunt circuit formed by and through the signal or alarm mechanism controlled by the electro-magnet, substantially as and for the purpose set forth.

5. The combination, with a closed main line circuit and an electro-magnet placed therein, of two shunt circuits, as described, the one through and controlled by a thermostat, the other through the alarm or signal mechanism, and brought into operation by the action of the magnet when the first is broken by the thermostat, substantially as and for the purpose set forth.

For the week ended October 20, 1874, and bearing that date.

156,015.—ELECTRIC LIGHTS. Mathias Day, Jr., Mansfield, Ohio, assignor to Seeley & Stevens, N. Y. Filed May 23, 1874.

Improvement of his patent of February 24, 1874. Frame used as part of circuit. Both electrodes caused to approach each other when current through holding magnets M M is weakened by increased distance between electrodes. Series of points relatively adjustable to each other by means of universal joint e.

1. In an apparatus for producing electric light, the combination, with the motor I, and the carbon-electrodes a a', of sliding bar E, the magnet M M, the gear J, the standard C, as and for the purpose specified.

2. The combination in an electric light apparatus of the circuit wires, and the pillar and standard A C, the arm L, the spring b, the bar E, the arm F, whereby the metallic parts of the apparatus itself are employed in place of line wires for the transmission of the battery current over the carbon points, as specified.

3. The combination in an electric light apparatus of the carbon points, arranged point to point, and made relatively adjustable by means of a universal joint, as and for the purpose specified.

156,114.—FIRE ALARM REGISTERS. John O. Alley, Detroit, Mich. Filed July 24, 1874.

Two trains, one actuating register wheels, the other shifting the pawl turning the register from one register to another. Lever E attached to hammer tail releases first clock work, allowing pawl to turn register wheel as often as signals composing one unit of the signal are given. Six seconds, without a stroke elapsing, the second clock work, through K, L and M, allows slide bar N to move, which carries the pawl to next set. The signal being complete, and a portion of the time between two signals elapsing, the pawl is carried on to face of smooth wheel C', leaving record of signal struck in the wheels.

The combination of a counter or register actuated by a clock work controlled by the gong hammer or other mechanism of a fire alarm telegraph, with a clock train which will permit the said counter to operate at fixed intervals of time, substantially as described.

156,175.—INSULATED ELECTRIC CONDUCTORS. Thomas L. Reed, Providence, R. I., assignor of one half his right to E. F. Phillips, same place. Filed July 6, 1874.

One or more electric conductors, enclosed, insulated and protected by one or more seamless braided jackets and intervening seamless jackets of elastic vulcanized caoutchouc, substantially as described.

For the week ended October 27, and bearing that date.

156,242.—ELECTRICAL THERMOSTATS. Wm. B. Watkins, Jersey City, N. J. Filed November 29, 1872.

Thermostat inclosed in tight cylinder.

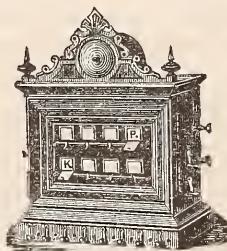
1. The combination of an insulated metallic strip circuit closer, with a closed or capped tabular box case, substantially as and for the purposes set forth.

2. In combination with the tabular case B, the dial plate M, pointer N and set screw R, all arranged and operating as hereinbefore described.

156,339.—TELEGRAPH CABLES. Germaniano Zanni, Highbury, England. Filed August 22, 1874.

A cable consisting of one or more conductors, each surrounded, first, by spirally twisted wires; second, by a coating of tin applied thereto by passing the twisted wire cable or cables through a bath of molten tin; and, third, by a wrapping of fibrous or other insulating or projecting material, substantially as shown and described.

CHAMPION BURGLAR ALARM AND ANNUNCIATOR COMPANY, 40 WEST 18th STREET, NEW YORK.



We invite TELEGRAPH MANAGERS AND OPERATORS throughout the country to act as our agents for the introduction of our superior BURGLAR ALARMS AND ANNUNCIATORS into private houses, hotels, banks, &c. Upon receipt of plans of houses we will send skillful mechanics to estimate upon work, or will give any information in writing that may be required, *Liberal commissions will be paid upon any orders that may be secured for us.* Our Alarms and Annunciators have just been awarded the FIRST PREMIUM of the American Institute Fair.

Explanatory Circulars will be furnished upon application to the Secretary.

L. G. TILLOTSON, *President.*
CORNELIUS ROOSEVELT, *Secretary and Treasurer.*
40 West 18th Street, New York.

PHILADELPHIA.

L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of

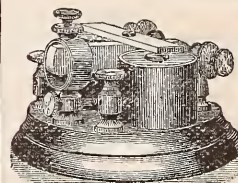
TELEGRAPHIC AND ELECTRICAL GOODS of every description, at

No. 54 SOUTH FOURTH STREET,

(Corner Chestnut street,)

PHILADELPHIA.

They solicit the patronage of their friends and the telegraphic fraternity generally.



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from,

LANNERT & DECKER, 31 1/2 Prospect St., Cleveland, O. Send for circular.



LECLANCHE BATTERIES.

IMPORTANT NOTICE.

After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,

No. 40 WEST EIGHTEENTH STREET;

or to

L. G. TILLOTSON & CO.,

8 Dey street, sole Agents.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with Iron, consists in its LIGHTNESS, relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.

ALANSON CARY, Treasurer,

No. 234 West 29th St.,

New York.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents. UNIFORM TO ALL POINTS. PROPORTIONATE TO ALL POINTS.

NEW YORK OFFICES:

66 Broadway.	21 New St.	71 Worth St.
364 Broadway.	108 Front St.	143 West St.
1218 Broadway.	481 Broome St.	307 Pearl St.

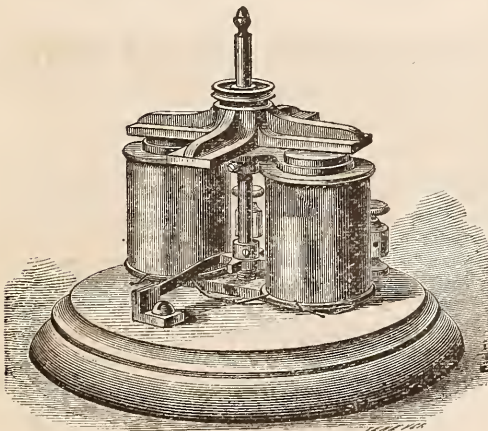
WILLIAM BROWNLEE, Dealer in CEDAR TELEGRAPH POLES OFFICE FOOT OF SHELBY STREET, DETROIT, MICHIGAN.

GEOURGE H. BLISS & CO.,
 41 Third Avenue, Chicago, Ill.
 CINCINNATI, O., ST. LOUIS, MO.,
 Elm St., cor. 5th. 409 North Third St.

Manufacturers and Dealers in
TELEGRAPH INSTRUMENTS AND SUPPLIES.

- RELAYS, unequalled for beauty and strength;
 - COMBINATION SETS; BOX and POCKET RELAYS.
 - CHALLENGE, PONY and REPEATING SOUNDERS.
 - KEYS, various styles, including the SOHNEIDER KEY, just out, no legs, wire connections above the table.
 - REGISTERS, with SPRINGS or WEIGHT.
 - CUT OUTS, many varieties, including a new style of PEG CUT OUT, with an adjustable LIGHTNING ARRESTER, just out.
 - REPEATERS—HASKIN'S AUTOMATIC, and others.
 - SWITCH BOARDS—REPEATING, BATTERY and GROUND SWITCHES and LIGHTNING ARRESTERS.
 - ANDER'S GALVANIC and MAGNETO-ELECTRIC PRINTERS; also SELDEN PRINTER.
 - ELECTRIC BELLS, HOTEL ANUNCIATORS, FIRE and BURGLAR ALARMS, and WATCHMAN DETECTORS.
 - ELECTRIC RAILWAY SIGNALS and ALARMS, ELECTRIC GAS LIGHTING APPARATUS.
 - MEDICAL INSTRUMENTS and APPARATUS on hand and made to order. Second hand Instruments for sale cheap, and repairing done at short notice.
 - BATTERIES in great variety, including the latest inventions; also a full assortment of battery material.
 - WIRES—MOORE & SON'S and PHILLIPS' MAGNET and OFFICE WIRES, GUTTA PERCHA and KERITE WIRES, BEST GALVANIZED LINE WIRES; SUBMARINE, SUBTERRANEAN and HOUSE CABLES.
 - INSULATORS—BROOKS, SCREW GLASS and KENOSHA CARBON. BRACKETS, PINS and SPIKES, TELEGRAPH POLES, LINE BUILDERS and REPAIRERS' TOOLS.
 - TELEGRAPH STATIONERY—REGISTERS, MESSAGE and MANIFOLD PAPERS, CARBON SHEETS, STEEL and AGATE STYLUSES, ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK and AWL CLIP, STANDARD TELEGRAPH BOOKS, &c.
 - PRICE LISTS FURNISHED FREE ON APPLICATION.
- Our TELEGRAPH INSTRUMENTS and ELECTRICAL APPARATUS are elegantly finished and mounted on highly polished rosewood, mahogany and walnut bases.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine
Run by Electricity!
 It will work well with an ordinary local battery.

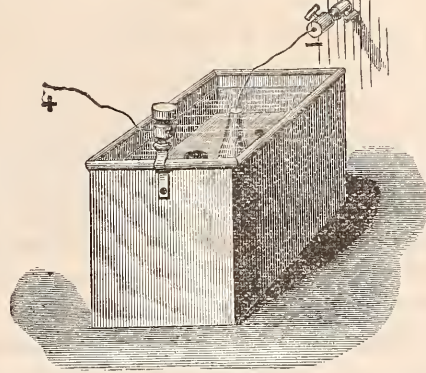
Price, with two cells' Eagles' Metallic Battery.....\$6 00
 " without Battery..... 4 00

May be seen working at the office of the THE TELEGRAPHER.

For sale by
The Electro-Magnetic Manufacturing Company,
 26 BROAD STREET, NEW YORK.
 P. O. Box 1804.

Also for sale by
L. G. TILLOTSON & CO., 8 Dey street.
F. L. POPE & CO., 38 Vesey street.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of *lead*, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready.

No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.

Descriptive circulars and price list forwarded upon application to

F. L. POPE & CO.,
 (P. O. Box 5503.) 38 VESEY STREET, N. Y.

WATTS & COMPANY,
 No. 47 HOLLIDAY STREET,
 BALTIMORE, MD.

SUPERIOR TELEGRAPH INSTRUMENTS, RELAYS, SOUNDERS, KEYS, OFFICE WIRE, BATTERIES OF EVERY DESCRIPTION, SWITCHES, GALVANOMETERS, RESISTANCE COILS.

A COMPLETE STOCK of EVERYTHING for the TELEGRAPH OFFICE or ELECTRICAL LABORATORY.

Special attention given to repairing Scientific Instruments. Several of our workmen having served their time in the most prominent European manufactories, enables us to guarantee satisfaction.

SEND FOR CATALOGUE AND PRICE LIST.

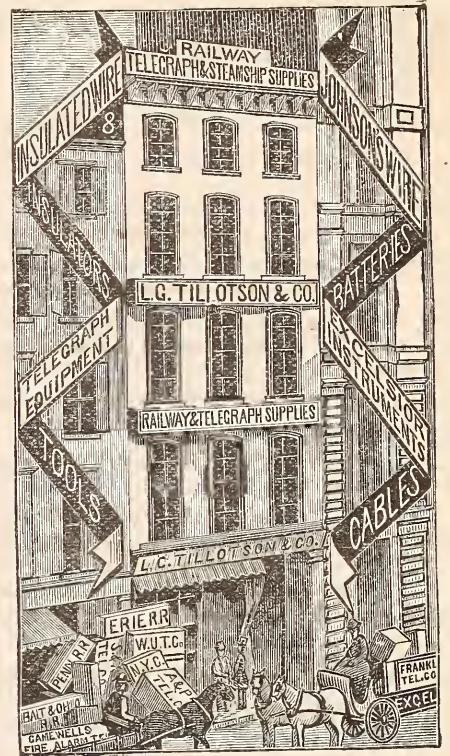
Send for their Price List before ORDERING ELSEWHERE. Which they are selling at prices to ASTONISH YOU.

TELEGRAPH INSTRUMENTS,
 OF A FIRST CLASS STOCK OF
 CLEVELAND, OHIO,
 OF
SHERMAN & LYMAN,
 TELEGRAPHERS.
TAKE NOTICE!

F. L. POPE & CO.,
 MANUFACTURERS AND DEALERS
 IN
Telegraph Instruments and Supplies.

STANDARD TELEGRAPH INSTRUMENTS,
 EAGLES METALLIC BATTERY,
 NONPAREIL TELEGRAPH INSTRUMENT,
 INSULATED WIRE, etc., etc.

Send for Circular and Price List. Address,
38 VESEY STREET, NEW YORK.
 (P. O. Box 5503.)



BUY THE BEST.

IF YOU WANT

EQUIPMENT

FOR A

TELEGRAPH LINE,

ORDER OF

L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**

They carry the **LARGEST STOCK.**

Their **PRICES** are the **LOWEST**
 and **QUALITY THE BEST.**

THEY GUARANTEE

EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**

EVERY ARTICLE REQUIRED FOR THE

CONSTRUCTION AND OPERATION OF LINES

ALWAYS ON HAND.

THEIR

EXCELSIOR

TELEGRAPH INSTRUMENT FOR STUDENTS,
 Comprising Sounder and Key, is the greatest
 success of the times.

L. G. TILLOTSON & CO.,
 8 DEY STREET, NEW YORK,
 54 SOUTH FOURTH STREET, PHILADELPHIA,
 22 WEST FOURTH STREET, CINCINNATI.

SPECIE BASIS REACHED AT LAST!

We are offering 20 per cent discount from list prices on all instruments of our manufacture.

L. G. TILLOTSON & CO.,
 8 Dey Street, N. Y.

AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
62 BROADWAY, NEW YORK.

J. W. STOVER,

General Agent and Superintendent.

L. B. FIRMAN, Chicago, Ill.,

General Agent for the West and North-West.

TELEGRAPH SUPPLY AND MANUF'G CO., Cleveland, Ohio,

Special Agents for the Middle States.

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Special Agent for Virginia and North Carolina.

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Special Agent for Georgia and South Carolina.

L. M. MONROE, New Canaan, Conn.,

Special Agent for New England.

ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,

San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which referencels
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

Albany, N. Y.,
Alleghany, Pa.,
Boston, Mass.,
Bridgeport, Conn.,
Buffalo, N. Y.,
Baltimore, Md.,
Chicago, Ill.,
Cincinnati, Ohio,
Columbus, Ohio,
Cambridge, Mass.,
Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
Fall River, Mass.,
Fitchburg, Mass.,
Hartford, Conn.,
Indianapolis, Ind.,
Jersey City, N. J.,
Louisville, Ky.,
Lowell, Mass.,
Lawrence, Mass.,
Lynn, Mass.,
Mobile, Ala.,
Montreal, Canada,
Milwaukee, Wis.,

New York City,
New Orleans, La.,
New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
Pittsburg, Pa.,
Portland, Maine,
Peoria, Ill.,
Providence, R. I.,
Quebec, L. C.,
Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
San Francisco, Cal.,
Savannah, Ga.,
Syracuse, N. Y.,
Troy, N. Y.,
Taunton, Mass.,
Toledo, Ohio,
Toronto, Canada,
Washington, D. C.,
Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the
apparatus may be distributed in a combination of circuits, and
the entire system successfully worked, without the constant per-
sonal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**,
adapted to produce the full tone of the largest church or tower
bells.

Fourth—The **Electro-Mechanical Gong Striker**,
for hose and engine houses, by means of which the location of
the fire is instantaneously communicated to the members of
each fire company.

These Features combined form the

Only **PERFECT, COMPLETE and RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by
the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of
practical use, and that the efforts which have been repeatedly
made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to
adopt other systems having demonstrated their insufficiency
and unreliability, and resulted in their abandonment, and sub-
stitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the
original *FARMER & CHANNING PATENTS*, one of the most
important of which has just been extended for seven years, and
during the past seventeen years have spared no expense or effort
to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have
adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little ex-
pense, compared to the benefit which it confers, that even small
communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS.

has met with the universal approbation and commendation of
the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POS-
SIBLE IMPROVEMENT which shall increase the

EFFICIENCY,

RELIABILITY and

ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruc-
tion, and the number of lives which have been preserved
through the general adoption of this system, throughout the
UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for
any considerable length of time, they have been ENORMOUS, THREE
CAN BE NO QUESTION.

The cooperation of **TELEGRAPHERS** in securing its in-
troduction into their localities is cordially invited, and

their efforts will be duly appreciated and
compensated.

Any information desired in regard to the above
system will be cheerfully and promptly furnished
upon application at the office.

A pamphlet, setting forth more fully its advantages and
superiority, has been printed, and will be supplied to Municipal
Authorities and others interested in Fire Alarm and Police Tele-
graphy, upon application as above.

CHARLES T. CHESTER,

104 Centre Street,

NEW YORK,

TELEGRAPH ENGINEER,

AND MANUFACTURER OF

INSTRUMENTS,

BATTERIES,

AND EVERY DESCRIPTION OF

TELEGRAPH SUPPLIES.

BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at
\$120 and \$135 a set, consisting of two Relays, two Sounders, two
Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-
locked connection between any number of wires, occupying for
each different connection only one square inch of space, and
though made of the largest size, not subject to the warp and
contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

OR

COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three
years, an Insulated Wire which can be buried in the earth or
exposed to rain and sun, or to the vapor of acids, without injury.
Professor SILLIMAN, who has exposed it to the most destructive
agencies, finds that it remains uninjured in an atmosphere of
ozone, which would destroy gutta-percha in a few hours. It
exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article
for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES

of the usual size, with KERITE COVER, believing that it will
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HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and
size of cable, which will be found to compete with any other
construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY,
with Patent Platina Connection, introduced by us eight years
since; also, THE ALPHABETICAL OR DIAL TELEGRAPH,
now extensively used in this and other cities for private lines,
being easily and quickly learned by any one.

We offer for sale, among other novelties, a **SOUNDER** that
will work practically with a single DANIELL cell, a **BATTERY**
that does not require to be taken down but once a year, and the
very best **MAIN LINE SOUNDERS** made

Our **CATALOGUE**, embracing a large amount of new matter
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BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
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Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
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Insulated Conductors.

These Cables are unexcelled in construction, and can be produced in less time and at about half the cost of those manufactured in this country.

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PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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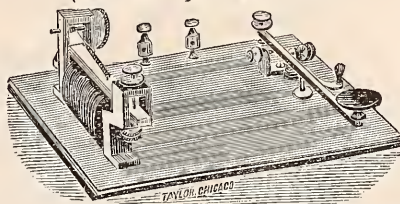
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See other advertisements. Send for Catalogue and Price List.

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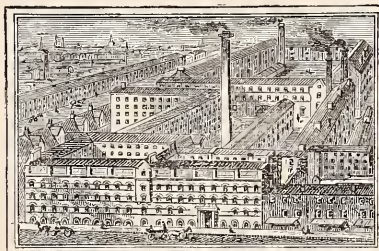
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 Five per cent. discount for cash in advance.

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SPENCERIAN DOUBLE ELASTIC STEEL PENS.

The superiority and excellence of these justly celebrated Pens are appreciated, as is shown in their constantly increasing sale. They are comprised in fifteen numbers, of which one number alone has an annual sale of more than

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Sample Cards containing all the FIFTEEN Numbers, securely inclosed, will be sent by mail on receipt of 25 cents.

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THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE

TELEGRAPH MANUAL,

BY

TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual," "History of America," "Civil War in America;" Member of many Scientific and Learned Societies of Europe and America; Commander of the Order of Dannebrog, Denmark; Order of St. Olaf, Norway, and of the Sword Order, Sweden; &c., &c., &c.

This great telegraphic work will consist of five volumes, 80 pages each, and will contain over

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The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

VOL. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

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VOL. IV.—A general history of the ancient and modern telegraphic systems, scaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

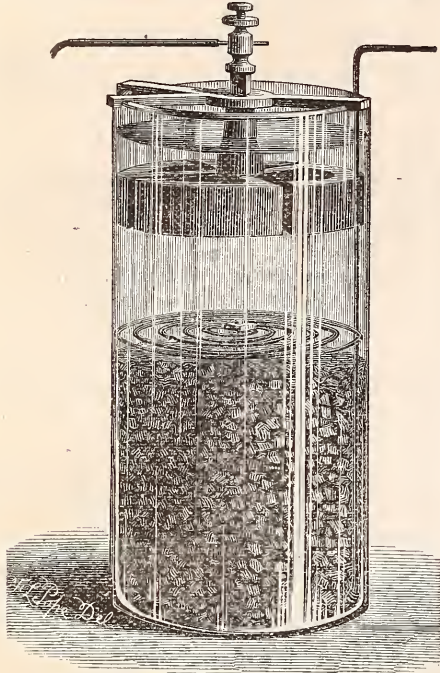
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter

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CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
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No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without **ANY ATTENTION** whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
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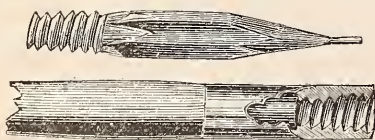
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"SAVE THE PIECES."

This HOLDER is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

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UNION BRAND, AND
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JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

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KENOSHA CROSS-ARMS.

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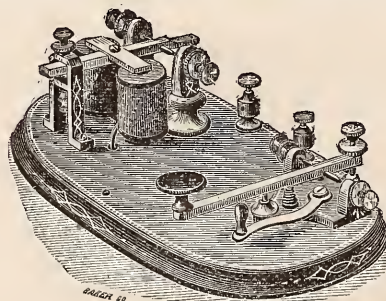
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Price, \$8.00.

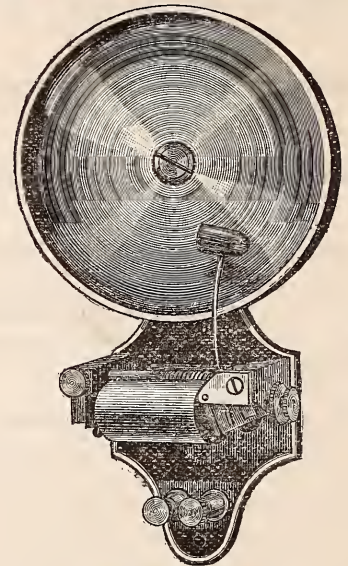
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The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

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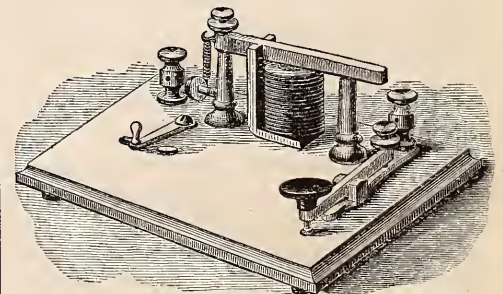
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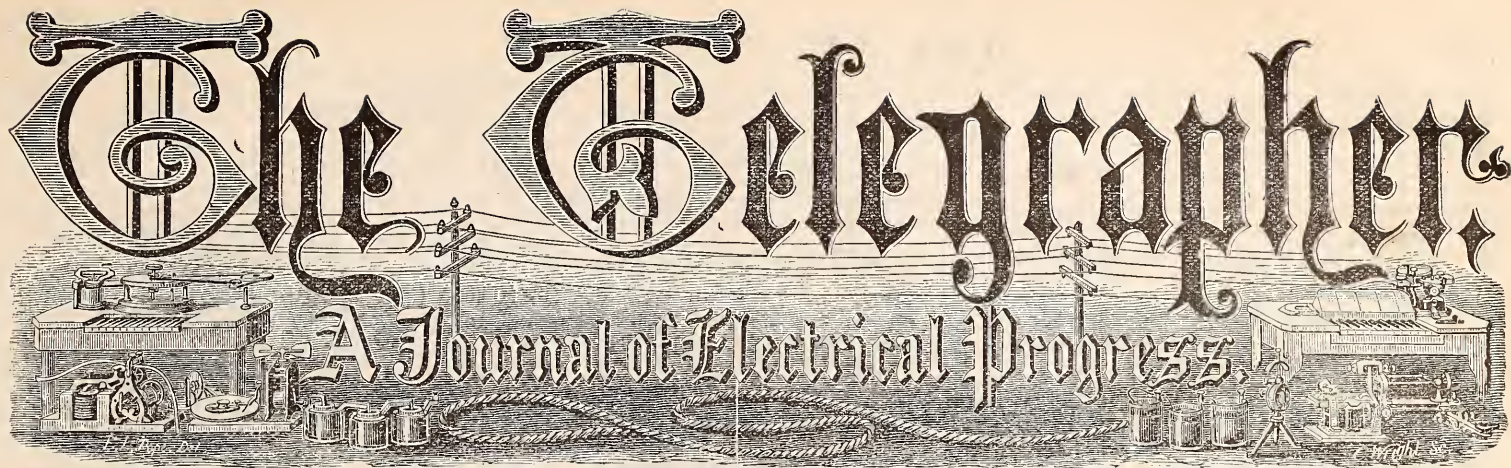
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, December 5, 1874.

Whole No. 438

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Batteries and Supplies of every Description.
Send for Circulars and Catalogue.

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FURNISH ALL DESCRIPTIONS OF
Copper Office and Magnet Wire,
OF OUR OWN MANUFACTURE,
WITH
EVERY VARIETY OF INSULATION,
FINE RESISTANCE WIRE and DOUBLE and
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My Wires were awarded the first premium at the Cincinnati Exposition of 1874, both for best "Office" and best "Insulated Line Wires."

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My Rubber Covered Wire will not crack, and is not affected by ordinary extremes of heat or cold. The rubber covering is of uniform thickness, and the wire will be found in the exact centre—a result not heretofore produced.

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With new and improved machinery I feel satisfied that I can furnish magnet Wires as good as any to be found in the market.

All Wire used by me is made to my special order, and is the best that can be procured in the market.

I could give a long list of testimonials, but depend on the merits of the Wire for patronage.

Please send for sample card and price list.

These Wires can be had at my prices of

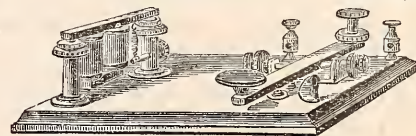
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FLEXIBLE CORDS, all kinds, &c., &c.

We warrant all Wire to be of the highest conductivity, tested by our Galvanometer, which compares with the tests of the highest authority in this country.

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TELEGRAPH INSTRUMENT,



(PATENTED JUNE 24, 1873.)

This apparatus is constructed of the best material, and finished equal to any Telegraph Instrument, and is warranted first class in every particular. It is especially adapted to the requirements of Students of Telegraphy and the operation of Private Telegraph Lines.

Price, complete, Sounder and Key mounted on finely finished Mahogany Base, with one Cell Hill's Patent Battery, with Chemicals, eight feet of Office Wire, and "Smith's Manual of Telegraphy"..... \$7 50
Two sets..... 14 50
Price of Sounder and Key only..... 6 50
" " " with Cut Out and Lightning
Arrester attached..... 7 50

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MANUFACTURERS OF
BRASS, COPPER & GERMAN SILVER WIRE.
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MANUFACTORY,
ANDOVER, Conn.

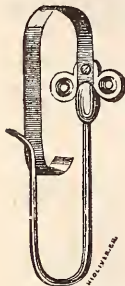
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The damage from the loss of a single message will equip a line many times with our new Hook, which gives great security.

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Price per dozen, \$3.00.

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We are now prepared to furnish these unrivalled Amateur Instruments, with or without Office Outfits, in any quantity and at a moment's notice. Our Agents may now send in their orders as rapidly as they please, and can rely upon their being promptly executed. Prices as heretofore.

Instrument complete, Key and Sounder..... \$6 50
Instrument with Office Outfit..... 7 50
Two Instruments and Outfits..... 14 50

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ENGINEER TO THE

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REVISED AND ENLARGED.

1 Vol. 8vo, cloth..... \$5 00.

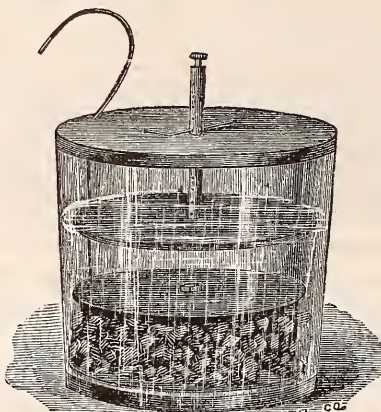
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This battery has just taken the FIRST PREMIUM—a SILVER MEDAL—FOR FORCE, ECONOMY and DURABILITY, at the CINCINNATI INDUSTRIAL EXPOSITION.



Price per Cell, \$2.00.

It will run as a local battery for six months without attention, and as a main battery for a longer period.

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NO OTHER MAIN LINE SOUNDER has proven as PERFECT an INSTRUMENT as that made by us the past two years.

LOW RESISTANCE, EASY ADJUSTMENT AND HANDSOME APPEARANCE COMBINED.

No other instrument offered for this purpose has the advantages secured in ours. See other columns of this paper.

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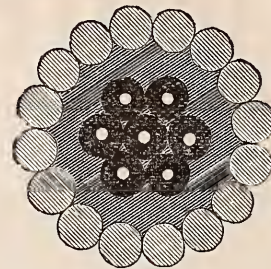
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THE TELEGRAPHER
A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, - - - - - PUBLISHER.

SATURDAY, DECEMBER 5, 1874.

VOL. X. WHOLE No. 438.

Atlantic Telegraphs.

THE past week has been one of considerable interest to the shareholders of Anglo-American, and to those of the United States Direct Cable Companies. Early in the week it was announced that the Direct Cable had again developed a fault, that the progress of paying out had to be again arrested and the cable itself buoyed.

Next came the publication of a correspondence in which the chairman of the Direct Company, referring to some vague report that her Majesty's Government was about to purchase the Atlantic cables, wrote to the Chancellor of the Exchequer to know if such was the case. That right honorable gentleman's secretary, replying in the name of his official chief, tells the inquirer—"The Government cannot be responsible for any reports which may have reached you. They have taken no steps and have no intention of taking any for the purchase of the Atlantic Telegraph or any other ocean line." This, we may presume, may be considered as finally disposing of rumors which took their origin out of the circumstance that a paper embodying that proposal was read and discussed at a recent meeting of the Society of Arts. Had the Government decided to obtain possession of the existing Atlantic cables they might have obtained them on terms which would admit of the Chancellor of the Exchequer obtaining a large net income from the working of them, while at the same time he might extend telegraphic communication with the British colonies on the principle of a uniform rate of charge which at present works so well upon the land lines of the Three Kingdoms. This, however, is just one of those questions which admit of a great deal of argument *pro* and *con*, and it is probable that, considering the present state of ocean telegraphy, her Majesty's Government has exercised a wise discretion in declining to entertain such a proposition. It, however, remains to be seen whether Government may not at some time hereafter show a disposition to adopt the plan, or some modification of it which may secure to the shareholders a guaranteed dividend, should they consent to have their lines worked at a uniform rate of charge—a policy which, however desirable in a social point of view, no body of shareholders could feel themselves justified, on economical and commercial grounds, in adopting. At all events, whenever a plan of the sort may be proposed we hope the shareholders will not show any precipitancy in their negotiations with the State, that they will not part with their property merely for what is called an adequate price, but will hold out for that premium to which their enterprise and public spirit is entitled in having had the courage to invest their capital in an undertaking surrounded by formidable difficulties, but fraught with inestimable advantages to the whole human race. They succeeded in their work, and their success entitles them to the consideration we have mentioned.

However, as regards the interests of the Atlantic Telegraph Companies, the most important event of the week has been the publication of the decision of the Imperial Government with respect to the Canadian Telegraphs Bill. As our readers will recollect, it was some time ago announced, on what appeared to be authoritative grounds, that the measure in question, notwithstanding the hurried manner in which it had been carried through the Canadian Parliament, had, upon its arrival in this country for the approval of her Majesty's Government, secured the royal sanction. At that time we ventured to doubt the report in question, and we intimated our belief that no Government, especially a Conservative Government, would countenance a piece of legislation the direct object of which was the confiscation of the rights of the shareholders in the Anglo-American Company. Recently we gave a particular account of the means resorted to by the promoters of this measure of confiscation in order to get it passed through the two Houses of the Canadian Parliament, and we at the same time expressed the opinion, which has been endorsed by the Opposition press in Canada, that if such a measure were to become the law of the Dominion the passing of it would deprive Canada of the confidence of capitalists and arrest her material progress. It appears from the letter of Lord Carnarvon that he has not only

fully appreciated what would be the effects of the bill, but that he has obtained a keen insight into the motives of its advocates and promoters. He states "that, after a careful consideration of all the very 'peculiar circumstances' of the case, he has arrived at the conclusion to tender no advice to her Majesty upon the present bill. Legislation on this subject being, in Lord Carnarvon's opinion, strictly within the competency of the Dominion Parliament, the fact that this measure has been, for certain special reasons, reserved does not appear to his lordship to be a sufficient ground for his doing more than leaving it in abeyance with a view to a further examination of the whole subject in Canada, which he has recommended."

Now, the fact of his lordship remitting the bill to the Legislature of the Dominion for further examination is the strongest possible intimation that her Majesty's Government considers that it has been passed without that due examination which a measure of such importance demanded at the hands of the Dominion Government. His reference to the 'peculiar circumstances of the case' may be taken as amounting to something more than a hint to the Canadian Government that measures which are expected to meet with the approval of the Imperial Government must be founded upon some other basis than such motives as appear to have actuated the promoters and wirepullers of the discarded measure in question. His lordship's opinion, that the measure is one strictly within the competency of the Dominion Parliament, shows that, should that body enact measures of confiscation and repudiation, they must take upon themselves the whole odium and responsibility of such dishonest legislation. The Imperial Government will have nothing to do with it.

As our readers will remember, the object of passing the bill was to bring such an amount of pressure to bear on the Anglo-American Company as to force them to waive the privilege which they exclusively enjoy of landing cables on the coast of Newfoundland. The effect of Lord Carnarvon's decision in refusing to sanction the bill is that it becomes abortive, and has no legal force, since it appears that, according to the 27th section of the British North American Act, 1867, "a bill reserved for the signification of the Queen's pleasure" cannot have "any force" until the Governor General signifies, either by message to Parliament or by proclamation, that it has received the assent of the Queen. We take it, therefore, that nothing more can be done in the matter until the next session of the Dominion Parliament, and we trust that by that time the further examination of the question recommended by Lord Carnarvon will open the eyes of Canadian Cabinets and Canadian Legislatures to the real character of the measure; and that they will consign it to the limbo set apart for such measures as are corrupt, dishonest, and destructive of national credit and national honor.—*The Railway News.*

Canadian Telegraphs Act.

We have received the following communications from the Anglo-American Telegraph Company:

"Sir—With reference to an act passed by the Dominion Parliament in May last, entitled 'An Act to regulate the Construction and Maintenance of Marine Telegraphs,' and reserved by the Governor General of Canada for her Majesty's pleasure, I beg to send you a copy of a letter received by the company from the Colonial Office this day, in which Lord Carnarvon's decision upon this act is communicated to the company. I think it desirable to draw your attention to section 27 of the British North American Act, 1867, which enacts that 'a bill reserved for the signification of the Queen's pleasure' cannot have 'any force' until the Governor General signifies, either by message to Parliament or by proclamation, that it has received the assent of the Queen. I am, dear sir, yours faithfully,

"H. WEAVER, General Manager."

"DOWNING STREET, Nov. 10.

"Sir—With reference to previous correspondence with regard to the reserved bill of the Canadian Parliament 'to regulate the construction and maintenance of marine electric telegraphs,' I am directed by the Earl of Carnarvon to inform you that, after a careful consideration of all the very peculiar circumstances of the case, he has arrived at the conclusion to tender no advice to her Majesty upon the present bill. Legislation on this subject being, in Lord Carnarvon's opinion, strictly within the competency of the Dominion Parliament, the fact that this measure has been for certain special reasons reserved does not appear to his lordship to be sufficient ground for his doing more than leaving it in abeyance, with a view to a further examination of the whole subject in Canada, which he has recommended. Lord Carnarvon had already announced this decision to the Governor General of Canada and to the Governor of Newfoundland. I am, sir, your most obedient servant,

ROBERT G. W. HERBERT,

"The Secretary of the Anglo-American Telegraph Company."—*The Railway News.*

The United States Signal Service.—Its Telegraphic Connections.

THE report of Gen. A. J. Myers, chief signal officer of the United States army, for the year 1874, has been presented to the Secretary of War, and is an interesting document, showing the great extent of the operations of the signal service, and the thoroughness and efficiency with which they are prosecuted.

From a synopsis printed in the New York daily *Tribune*, the following extracts have been made for THE TELEGRAPHER:

The satisfactory nature of work now done by the Signal Service, in connection with the Department of Meteorology, has induced Prof. Henry to relinquish into its hands the great system of meteorological operations carried on for so many years by the Smithsonian Institution, and its hundreds of observers, resident in nearly every county in every State in the Union, have been requested to transmit their communications to the War Department. A similar service, which has been conducted satisfactorily by the Medical Department of the army, has also been transferred to the Signal Office, so that that establishment now controls the entire meteorological interests of the United States.

The daily publications of the Signal Office consist, in addition to the "probabilities" furnished to the papers, of a review of the weather for the preceding seven days, and of a map showing graphically the conditions of the atmosphere at 7:35 A. M. of each day. There is also a review monthly of the weather, with several maps, showing the mean barometric pressure, the temperature, the rainfall, etc., together with several other series of more or less varied interest.

* * * * *

Another extremely important feature of the Signal Service operations during the past year has been its connection with the Life Saving Service. It may be remembered that Congress has authorized the establishment of a certain number of life saving stations at different points on the coast, where crews are to be placed permanently for the relief of vessels in distress. With each such station there is combined a telegraph station supplied by an observer of the corps, not only for the purpose of giving the meteorological indications at the station, but also to furnish information in reference to threatened or actual wrecks, and the measures necessary for their relief. At present these stations extend from Sandy Hook to Barnegat, and from Norfolk to Cape Hatteras, and others are being constructed as rapidly as possible. Connected with this system is a series of telegraphic signals by which passing vessels can report at any point off the coast and have information conveyed from the station to their owners.

The men engaged in this are all skilled telegraphic operators, and are familiar with the system of international codes, so as to telegraph properly the vessels of any nationality. The cautionary signals are also displayed at all of these stations, so that a vessel approaching the coast is first warned of a storm, if one is impending within the scope of the observation of the central office; if shipwreck is imminent, assistance can be summoned to come on steamers from ports far and near, perhaps in time to avert the disaster. If aid fails and the ship must strike, the life saving service can be concentrated from other stations and in any force needed. If the vessel is actually wrecked, notice can go to all parties interested, while lists of passengers and crews saved or lost can be made known and provision sought for the necessities. Throughout all the course of the occurrence the central office can be constantly informed. A naval vessel appearing off one of the signal stations can transmit a communication to Washington or receive orders in cipher or by signal. In time of war, with the system completed, no part of the coast could be menaced without knowledge at the great centres, at headquarters, along the coast, or throughout the country, if need be, of the character of the menace and the locality. In time of peace, if desirable for commerce, a record can be kept of passing vessels, showing their signals, or brief messages can be signaled to or from them. It is contemplated to equip each station with a semaphore for uses of this kind, when flags may fail, and for the purpose of enabling them better to communicate with foreign vessels.

Another subject in charge of the Signal Service has been the building of United States lines of telegraph in Texas and Arizona, the first mentioned being about 1,200 miles in length. Much progress has already been made in this enterprise, the entire work being performed by the enlisted men of the army, under the direction of the Signal Service. It is proposed ultimately to connect all the military posts by lines of telegraph, and thus greatly to enlarge the efficiency of our small army, and to reduce the cost of its operations.

The chief signal officer calls the attention of Congress to the importance of providing for a more permanent organization of the corps, especially in the way of promotion within the service, so that as soon as thoroughly trained an officer may be continually carrying his experience and abilities into a higher and higher position.

The duties of this branch of the army are equally important both in peace and war, and Gen. Myer sees no impropriety in providing that these duties shall be continuous, as in the engineer corps, the ordnance, and the artillery, and that if thought expedient the Signal Bureau may be added as a permanent branch of the service in the same manner. He also asks that the President be authorized to detail or appoint as assistants to the chief signal officer eight officers, with the rank and pay of captains, and eight with the rank and pay of first lieutenants while so serving. The additional expense would be but a few hundred dollars; the benefits to result to the service would be worth many times the expenditure.

Electric Headlight for Locomotives.

A NEW method of illuminating railways was tried for the first time in Russia on the Moscow and Kursk Railway on the occasion of the Emperor's recent journey over that line, and the experiment proved to be a perfect success. The apparatus consists of a battery composed of forty-eight elements, which, when fixed on the locomotive, lights up the railway for a distance of 500 yards with electric light. It is the invention of Herr P. N. Jablotschkoff, the head of the telegraph department of the above named railway. On the occasion alluded to he conducted the experiment in person, and the Czar was pleased to express his full approbation of the invention as one calculated to prevent accidents by collision in the dark.

Original Article.

Bear's Principle of Balancing Batteries.

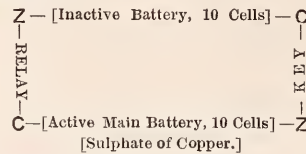
IN my three published methods of duplex telegraphy the only objection I have been met with is that the opposing, diverting or balancing battery affects the relay at the sending end or on the sending side. In order to entirely obviate this difficulty, if possible, I was led by a chain of theorizing something like the following to test the matter practically several years ago. All the authorities I have been able to find on this subject declare that the addition of ever so much "quantity" of a current does not increase its "intensity," nor will the addition of "intensity" increase the "quantity" of electricity generated in battery. This being true, it is very probable that the reduction of "quantity," even to nil, will not in the least reduce the "intensity" or potential of the battery. Indeed, this seems to be proven by the experiments described in an article on "The New Contact Theory," copied in two numbers of THE TELEGRAPHER last summer.

In the experiment I found that although the metallic plates were ever so small, there was in a similar main battery sufficient current to work the relay, unless adjusted up, on account of short circuit, without including an opposing battery, as in my third plan; and further, the resistance of these small plates was too great an objection.

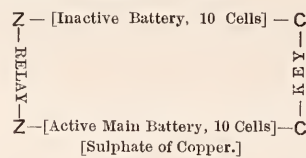
How, then, can quantity be disposed of entirely? Simply by omitting the sulphate of copper or zinc consuming acid. And just here I would say that my experiments have taught me that in the blue vitriol battery action does not depend upon the zinc being in contact with the acid, although this fact may be old to others.

But we will then practically have no battery at all! Here are two conflicting ideas. First, if reducing the quantity does not in the least change the "intensity" or potential, then by having the battery entirely inactive will not change its potential. Second, an inactive battery has no difference of potential at all between its poles. But theories weighed in the balance with experiments are often found wanting. The best method of proving the truth of this matter that I could think of was to connect similar poles of large plates of one cell to small ones of another, to see if the greater current would not overcome the lesser and operate the delicately adjusted instrument, but it would not, even by adding several more similar large plates to increase the quantity on one side, and only one small cell on the other side of the instrument. Thinking that the connections perhaps, through small cups were imperfect, I changed the poles, and the instrument worked as strongly as I could expect. I then put two new small plates that had never been used into a cell of common salt and water, and used it in place of a small active cell, trying it the same with the same result. But it occurred to me that perhaps the brine caused a slight galvanic action, therefore I again made the same tests with two large plates in a large cell of pure water, being careful to prove its conductivity by connecting opposite poles and working the instrument after having first had similar plates connected and delicate adjustment, with the same result again. Yet, again I apprehended some current might exist by the contact of the copper and zinc plates in the inactive cell, too weak for my instrument to indicate; therefore I connected a large number of inactive cells in a main battery for the purpose of increasing the

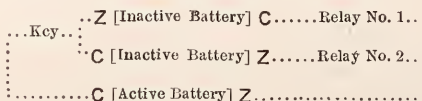
intensity of the small quantity (if any) of current in the inactive cells, until it should affect the instrument, but it failed to do so. Still not satisfied, I passed the current from my experimental active main battery through the inactive main battery, with opposite poles connected, of course, and then connected the same inactive battery alone in short circuit through delicately adjusted instrument; but not the least perceptible effect from any residuary current left by the active battery. Therefore I claim that an inactive plate element cell or battery has the same powers of resistance, repelling, neutralizing, diverting or balancing as the active battery. I used as high as ten cups on a side in these experiments, thus:



and connected in opposition, thus:



Finally, I arranged the connections as follows:



In this arrangement, each of the three batteries consisted of the same number of elements, the active battery being composed of Hill's and Daniell's cells (sulphate of copper).

In this last method, relay No. 1 responded promptly upon closing key, while relay No. 2, with the most delicate adjustment possible, remained invariably unaffected. S. J. M. BEAR.

The Telegraphers' Mutual Benefit Association.

ASSESSMENTS NOS. 70 AND 71, ISSUED NOV. 30TH, 1874 DEATH OF E. B. MCDILL AND W. C. HAVENS.

E. B. McDill (Certificate No. 2,235, issued April 7, 1874), died at Rosedale, Ks., October 7, 1874. Mr. McDill fell between the cars of a train upon which he was travelling from Leavenworth to Rosedale, and was almost instantly killed.

W. C. Havens (Certificate No. 133, issued Nov. 23, 1867), died at Brooklyn, N. Y., October 29th, 1874, of Bright's disease of the kidneys.

Two dollars are due on above assessments from members whose certificates are numbered not above 2,312; one dollar from those holding certificates between 2,311 and 2,340.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AND INCLUDING NOV. 24, 1874.

ASSESSMENT No. 69.

- List of numbers from 8 to 1358, representing assessed members.

- Long list of numbers from 1366 to 2258, representing assessed members.

ASSESSMENT No. 68.

- List of numbers from 27 to 2177, representing assessed members.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice, that the acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

An Excursion of Telegraphers.—Their Tribulations and Adventures.

CINCINNATI, O., November 16.

TO THE EDITOR OF THE TELEGRAPHER.

DURING the recent meeting of telegraphers at Chicago an invitation was extended by Mr. C. H. Haskins, of the Northwestern Company, and Supt. Thayer, of the C. & N. W. R. R. Telegraphs, to take an excursion fifty miles up the Lake. Quite a number accepted the invitation, and accordingly all were to meet at the C. & N. W. Depot at eight o'clock A. M.

Owing to the high degree of entertainment given at the Palmer House it was quite difficult to induce some of the party to quit the breakfast table in time to reach the depot at the appointed hour. In fact, there was a Row(e) at the table. Some started—some didn't. Those who did start were again delayed by one of the party discovering that he had folded his morning paper with a wrinkle in it. Some time was lost in correcting this blunder. A forced march was then ordered, and all struck out handsomely, but soon came to another halt. A drawbridge was found perpendicular to our line of march. This was soon righted, and on we went with increased Speed (better known as F. M.) Each one carried his watch in hand, counting the seconds as they flew; all declaring their time was too fast, and no use of being in such a hurry. The depot was finally reached in good time—to see the train pass out at the distant end. A heated discussion here arose as to whose watch was right and whose wrong. This was soon settled by Wright claiming that he was the only Wright one in the party. Claim allowed without further debate.

It was then unanimously decided not to go on the eight o'clock train. At this juncture steam was discovered in the distance, supposed to emanate from a tug boat. This was our chance; we would charter this tug and make our own time card. Again we were doomed to disappointment; instead of a tug it proved to be Colonel Wilson, trying to make the train on the last second. When he discovered our sorrowful looking crowd he suddenly remembered he had city time instead of railroad time, and, consequently, was several minutes too late.

Another parley followed, and it was decided to go or "bust." Our sorrows all vanished when we were informed that another train left at nine o'clock. We

fooled this train by setting our watches fast. When it left we weren't left.

The C. & N. W. R. R. is too poor to buy iron rails, so they have to content themselves with steel ones. It was a most delightful ride, which I presume was due to the fact that we *steeled it*. Kenosha was our objective point. On reaching there we donned a sanctimonious air and took carriages (speed being exhausted) for the headquarters of the Northwestern. After making the acquaintance of our genial friend, President Simmons, and taking a side squint at the good looking lady operators, we were conducted to the Kenosha Insulator Works. Our previous experience with Pond insulators had been such as to encourage profanity, and I, for one, didn't care about fooling my time away looking after them. I decided to go along, however, and after viewing the establishment a few minutes, was impressed with the idea that "a fellow can't most always exactly tell that which he least expects the most."

The Kenosha insulator is entirely different in construction from the Pond. The former strong and substantial, the latter a failure, mechanically and insulatively. After passing through the establishment and examining the various processes through which the rude block of wood passes before it becomes a complete insulator, we were shown into the testing room, where every insulator is subjected to the most thorough test, as follows:

A large vat, capable of holding two hundred insulators, is filled with acidulated water and connected to one pole of a five hundred cell carbon battery. Into this vat the insulators are placed in an inverted position, so that the upper edge of the cup is above the water. The cups are next filled with water and connected successively to the other pole of the battery, a very sensitive Varley galvanometer being in the circuit. If the slightest moisture penetrates the wood the galvanometer will at once show it, and the insulator is condemned. Moisture will not collect upon the outside of this insulator as it does on glass. Each one being immersed in water before being tested, if any moisture adhered to the outside it would be detected when tested with such a powerful battery and delicate instrument. The wood is prepared in such a manner as to render it tough; you can pound it up like an old oyster can but it won't split. They are not easily damaged by being struck with missiles; this is a great advantage they have over the glass. They are rapidly coming into use in the West, and are destined to supersede the glass. The Kenosha Company also manufacture a peculiar style of telegraph pole intended for use over the prairies where fires destroy the ordinary cedar poles. The wood is prepared similar to that intended for insulators, and will stand a high degree of heat without being destroyed. Their shape is that of a tripod, with a central shaft about twelve feet high, the tripod being about eight feet high, buried two feet in the ground. The poles are made for but one wire and are very substantial and durable, notwithstanding the shafts and tripods are but two or three inches in diameter.

After completing our inspection of the insulator works we repaired to the residence of President Simmons and partook of his hospitality.

The amount of oysters and other edibles that the party insulated no doubt astonished our host, and he will in the future be more careful in his invitations. If there is any one thing more than another that a party of telegraphers on a bender are expert at its *tucking away grub*.

The return to Chicago was effected in good style. The first thing worthy of mention after our arrival there was a despatch from Stum-body at Cleveland, informing us where he had, before starting homeward the previous day, found an extra good article of W—I am perfectly willing, as far as I am concerned, to continue this narrative, but have decided not to do so until after consulting the other fellows. The subject of spiritualism as performed through magnetic agency will form a subject for another article. M.

Uncalled for Criticisms of a Social Club.—Chicago District T. M. B. Association.—Report of Delegate Jones.—Proceedings of the American Electrical Association.

CHICAGO, Nov. 30.

TO THE EDITOR OF THE TELEGRAPHER.

CONSIDERABLE excitement was occasioned among those of the fraternity here who belonged to the Merry Meeting Club in regard to the showing up "Cameo" gives them in a recent number of the *Operator*. They are rather of the opinion that as long as it was not strictly a telegraphers' club, but really composed of ladies and gentlemen outside the ranks, that is was rather small business in the aforesaid correspondent to write them up. Quite a premium could be obtained no doubt for the real name of "Cameo."

A meeting of this District of the Telegraphers' Mutual Benefit Association was called for Sunday,

Nov. 22d, at the Gold and Stock Rooms in this city, for the purpose of hearing the report of Mr. F. W. Jones, the delegate to the annual meeting in New York, the 11th ult. There were but five members present, the day being very wet and disagreeable, and there not being a quorum the meeting adjourned indefinitely. Through the kindness of one of the members, I was permitted to see Mr. Jones's report, which had been placed on the Secretary's desk, which reads as follows:

CHICAGO, Nov. 21, 1874.

To the Members of the Telegraphers' Mutual Benefit Association—District of Chicago.

Your delegate to the seventh annual meeting of the Telegraphers' Mutual Benefit Association, held in New York City on Wednesday the 11th Nov., begs leave to present the following report:

The instructions received from you at your previous meeting in regard to the restoration of delinquent members of our Association were fully observed, and your views were advocated before the annual meeting with all the ability at my command. A very generous policy was adopted, allowing persons who had forfeited membership to become eligible to membership by the payment of back dues to an amount not exceeding five dollars. It was considered to be fair that whatever assessments were made upon a member during the life of the policy held by said member should be honorably paid, in case of delinquency and restoration; but to prevent complication of accounts and an increase of clerical labor, it was resolved to make a fixed maximum sum for readmission. This seems entirely right and I think it will amply protect our Association. From the fact that but 188 applications for membership were made during the past year, against 475 the previous, the initiation fee was cut down to two dollars.

Mr. Tillinghast, the Buffalo representative, introduced a measure to increase the reserve fund to ten thousand dollars, to be accomplished in three years, by raising it to \$5,000 this year, \$7,500 next, and \$10,000 the third. It was almost unanimously adopted. The arguments for an increase of reserve fund were, that it would give greater stability to the Association, and the members would have a better guarantee that their claims would be promptly met in case of death. Should any fatal calamity visit seven or eight of our members at the same time, our Association will have the ability to extend instant aid to their families without depending on the uncertainty of assessment collections. In any case the interest of \$10,000 will be a welcome addition to our reserve fund.

Your delegate suggested the propriety of the West having a voice in the Executive Management, and the favor was granted with exceeding unanimity and good will. Mr. C. H. Summers, holding certificate No. 171, was elected upon my nomination. The South taking advantage of the opening, also asked for an Executive officer, whereupon Mr. J. M. Crowley, of Augusta, Ga., was elected.

A resolution was adopted to allow members to withdraw from the Association by paying all dues and receiving from the Secretary a certificate of withdrawal. It was also agreed to allow delegates at all coming annual meetings to cast as many votes as the number of members they represent. Such delegates must have written evidence of their authority to act.

I hope to be able to place a full report of the Secretary and Treasurer in your hands. Our members at present number 1,200. Cash on hand \$3,700.

Colonel J. J. S. Wilson kindly furnished passes for me from Chicago to Buffalo and return. N. Hacker, of Buffalo passed me from Buffalo to New York, and Genl. T. T. Eckert, Gen. Supt. East. Div., passed me back to Buffalo. The many courtesies I received at the hands of the officials in New York must have been extended more to the western members than to me personally, as they were beyond my merit. I accepted their many courtesies as an evidence of their desire to stand on brotherly footing with the great west, and to show their appreciation of our unflagging support and cordial cooperation in the affairs of the Association. Thanking you for the honor of representing you, I trust my feeble efforts are not disapproved. May we all do our part unselfishly to promote the good of those with whom we associate.

The sixteen dollars paid for assessments by each of us during the past year is not missed from our purses, but who can tell the good done by the aggregate amount. Unspeakably keen and crushing is the woe caused by the death of a husband, yet add to it the weight of cold penury when the last support of the household is removed, and what can befall us worse? Storied urn or animated bust cannot recall the fleeting breath to its mansion, but little acts of kindness, punctuality in meeting our assessments, may make lighter many heavy burdens of sorrow that the future holds locked up for some of our families during the coming year.

I fervently hope they may be few and far between,

but in any case I will always be found at my post of duty, lashed there with a rope when my legs fail.

Very respectfully, your obedient servant,
F. W. JONES.

The regular monthly meeting of the American Electrical Society was held at General Stager's room on the 18th inst, at 7.30 P. M. The following members were present: C. H. Summers, H. C. Maynard, J. C. Fowler, W. C. Long, G. H. Bliss, H. Stanbury, C. S. Jones, J. J. S. Wilson and F. W. Jones. In the absence of the President and Vice-President, Mr. C. H. Summers was called to the chair. Rec. Secretary C. S. Jones read proceedings of the previous meeting. The Executive Committee were asked for a report, but were not ready, as several sub-committees that have special work assigned them had not completed their labors and reported to the Executive Committee yet, especially one which was to confer with the managers of the Academy of Science in regard to renting a hall, etc.; but it was thought that in a week they would be able to report in full. The Recording Secretary, who had in charge the preparation of blank forms, submitted a formal report, and those present manifested acquiescence in all he had done.

The printing for the society had been contracted for, and all the blanks, with the exception of one, was well under way. This one—that of a certificate of membership in the society—the secretary had thought best to confer with the members in regard to in open meeting, as it should be, in his opinion, something emblematical of the society. Col. Wilson thought it should be something that would demonstrate the word "electrical" in all its meanings. After considerable friendly discussion, it was decided to invite all the members of the telegraphic profession who could draw and make designs to get up something in their judgment emblematical of the society, and have them forwarded to the Recording Secretary, and if no particular one happened to strike the idea, probably out of the whole, by taking parts of each one's contribution, something very fine could be gotten up. The meeting then adjourned at 8.45 P. M., to meet at the same time and place the following Wednesday evening, when a larger meeting was anticipated.

The adjourned meeting, however, was a failure, as I am informed there were but three members present, viz: Recording Secretary C. S. Jones, night manager; H. C. Maynard, of the W. U.; and W. C. Long, one of the operators of the day force W. U. main office. Can it be possible that the American Electrical Society is so soon dead? Let us hope not, and see a proper representation at the next monthly meeting on the third Wednesday of December.

After "Occasional" called attention to my negligence in slighting Whitford's daughter by failing to notice her *debut* into fashionable society, the leading question here was, "Well, how old is Whit's baby anyhow?"—Answer. Over five mouths. Now, "give us a rest." DOCTOR.

Parade and Festival of American District Telegraph Messengers.

THE parade of the American District Telegraph Volunteers, composed of the messengers of that company not on duty, came off, as announced, on Thanksgiving day, and was a very successful affair, and one very heartily enjoyed by all who had an opportunity to participate.

After the parade was organized the boys marched down to the City Hall, in front of which they were reviewed by the President of the company, Mr. E. L. Andrews. At this point there was a competitive drill and marching match between the messengers of the several districts, the prize for which was awarded to the company of the Twenty-eighth District. The boys then marched to Fulton Ferry, and, arriving at Brooklyn, they took the cars to Myrtle Avenue Park. Here they competed for prizes in foot and sack races and target shooting. The prizes were vacuous of from one day to one week, with pay, and in some cases silver medals were also awarded. The first prize in the foot race was won by John Moran, of the Thirty-first District. The first prize in the sack race, which afforded a great deal of merriment to the boys, was won by Weiss, No. 282. The shooting match followed, but as the judges were unable to ascertain the points scored by each contestant before the party left the park no decision was made. The distance was 140 feet, position standing, two rounds being allowed each boy. One boy made two bull's-eyes, but one shot was protested, the boy having rested his arm in taking aim. A plentiful dinner was prepared for them, and they enjoyed it heartily. After the festivities the boys walked back to the Ferry and returned to the city.

The total number of messages forwarded from postal telegraph stations in the United Kingdom during the week ended November 7, 1874, was 364,306, an increase on the corresponding week last year of 6,245.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, DECEMBER 5, 1874.

THE TELEGRAPHER:

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TENTH VOLUME.

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It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST of THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

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TELEGRAPHIC FRATERNITY

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MORE THAN TEN YEARS,

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Publisher.

Special Notice.

FROM and after January 1st, 1875, the United States postage on THE TELEGRAPHER will be prepaid by the publisher. Notwithstanding the additional expense the price of subscription will remain as heretofore, Two Dollars per annum, payable in advance.

Hereafter it will not be necessary for subscribers in the British North American provinces to remit the additional twenty cents heretofore required for the payment of the United States postage.

The Inducements to Engage in, and the Objections to Telegraphic Service.

AS THE TELEGRAPHER is naturally supposed to be fully informed in regard to telegraphic matters, we frequently receive letters, the writers of which are desirous to know the length of time required to enable them to become telegraph operators, and the inducements in the way of emolument, etc., that may be expected to reward their efforts to qualify themselves for the service.

There is a kind of fascination in the idea of becoming a telegraphic operator, to the mind, of youthful persons especially, which is calculated to attract them to the business, more particularly if they have little personal knowledge of its conditions and requirements. The ability to communicate instantaneously with individuals hundreds and, perhaps, thousands of miles distant, practically annihilating time and space, seems marvellous, and the desire to enter the apparently charmed circle where such wonderful performances are habitual and constant is not matter of surprise, when viewed from the ordinary standpoint. This has been demonstrated from the first introduction of the telegraphic art, by the fact that there has never been a lack of telegraphic students.

This has been taken advantage of by the proprietors of the so-called telegraph schools, institutes and colleges, and their advertisements and circulars are filled with glowing and, sometimes, rhapsodical statements of the pleasure and advantages to be derived from becoming telegraph operators, which the readers are assured any person of ordinary ability and acquirement may become by a longer or shorter term of instruction at their institutes, and the payment of some ridiculously small sum, compared to the advantages to be derived. According to these veracious circulars there is always a chronic scarcity of telegraphic labor, and telegraph managers and superintendents are eager to engage the graduates at almost any salary whenever they have completed the prescribed course of instruction.

How different the reality is from either the imagination of those who aspire to become telegraphers, or the lying statements and assertions of the circulars mentioned, those of our readers who are actually engaged in telegraphy do not require to be told. We have so often exposed the falsity of the statements made for the purpose of entrapping ignorant and confiding boys and girls into patronizing these manufactories of telegraphic plugs, that it is scarcely necessary to attempt the task anew, and such is not our purpose in the present editorial. We propose merely to state plainly what the real inducements are to engage in telegraphy as a business, the objections to, and disadvantages of the telegraphic service, and the present condition of the service as regards the supply of operators. No doubt a majority of those who read THE TELEGRAPHER have friends and acquaintances who are considering the question of engaging in telegraphy, and we hope to be the means of enabling them to give such information and advice in reference thereto as may in some cases prove satisfactory and advantageous in the final decision arrived at.

The ability to communicate instantly with persons and places widely separated is at first a great attraction and satisfaction to most telegraphic neophytes. It is something so out of the common experience that for a time it undoubtedly has a tendency to elevate us

in our own conceits, and cause us to regard ourselves as a little above the unfortunates who are unacquainted with practical telegraphy. This, however, soon wears off, and by the time the operator has settled down into regular telegraph service, he finds that, like any other mode of working for a livelihood, it is one of labor and toil, and the hour which releases from duty is as welcome as to any other of the working classes. As before stated, it is sufficient to attract constantly an over supply of new students, and keep the telegraphic ranks not only filled up, but generally more than adequately supplied with recruits.

The popular idea is, and this is assiduously fostered and encouraged by the proprietors of the so-called telegraph schools, that there is always a great demand for telegraph labor. That such is not the case at the present time, and that it has never been more than exceptionally true, all who are familiar with the telegraph business will bear witness. About the only time within our recollection when the demand for telegraph operators exceeded the supply, was for a period during the late war, when the Government took up a large number of them for military lines, and the telegraph business, from causes arising from the war, was very active. When peace was restored, and the Government no longer required the services of military telegraphs and telegraphers, those who had been thus engaged returned to the commercial lines, and there has been no scarcity of operators at any time since. During the past fifteen months there has been but comparatively little, if any, addition to the aggregate of telegraph lines and offices, and fewer operators are probably now required than before that time. If there were no additions to the telegraphic ranks for the next year or two we do not believe there would be any lack of operators to supply the demand. Were it not for the fact that so many are annually withdrawn from the telegraph service to engage in other employments, the pressure for situations would be even greater than it is at present.

As regards the compensation of telegraphers very extravagant ideas are apt to be entertained, and on this point the representations of proprietors of telegraph schools are vilely deceptive. They quote salaries of operators at anywhere from \$75 to \$150 per month. As a matter of fact we doubt whether the pay of operators will average more than \$40 per month. It is true that in some of the larger cities, and in the main offices, there are operators who receive from \$75 to \$100 per month for their services, but this is exceptional. In common with all classes of labor, the tendency of telegraphers' compensation is to a lower scale, and while there is so great a supply of operators and a comparatively limited demand, we cannot see a prospect for improvement in this respect.

In telegraphy as in other business, there are some positions which are better paid, but these are comparatively few in number, and usually require years of service and personal influence, which a majority of telegraphers lack, to secure. And it must be confessed that if the higher and better paid positions are few the number of those qualified to fill them is limited. We do not mean to say that these positions are always awarded to those best qualified for them, for we are aware that too frequently such is not the case. But lacking ability, or even with it, usually personal influence, in telegraphy as in other descriptions of business employing skilled labor, is requisite to secure what are generally regarded as the more desirable positions.

It may be taken for granted that, as regards the employés, telegraphy is not essentially different from any other occupation, except that it attracts a larger number of young persons to it, and a sufficient smattering of the knowledge requisite may be acquired to enable a person to occupy some sort of a telegraphic position. To become a good, or what is commonly understood as a first class operator, capable of filling creditably a first class telegraphic position, requires long practice and hard work. Telegraphy is no business for a lazy person. One who is ambitious of being a successful telegraph operator must be willing to labor hard, and if he

aspires to fill the higher positions in the business, which require something more than mere mechanical facility of manipulation, must study the science which underlies the telegraphic art.

It is not our desire or purpose to prevent any person who may desire to do so from engaging in the telegraphic service, and we do not flatter ourselves that we should meet with much success even if it were. We only wish that those who are considering the question should understand exactly what they are about to do, and should decide understandingly in the matter. What we do desire, and what we wish to impress upon not only those who are about engaging in telegraphic service, but also of many who already consider themselves and are considered telegraph operators, is the necessity, if they wish to become creditable members of the telegraphic fraternity, of understanding the principles, and at least the rudiments of electrical science, as well as of the telegraphic art. What is wanted is not mere telegraph operators, but better qualified and educated ones. There is no room in the service for mere plugs. There are already some thousands more of these than are required, but of what should properly be regarded as really first class capable operators, there is and never has been an over supply.

It would undoubtedly be to the advantage of telegraph employers and managers if they would systematically offer more inducements in the way of promotion and compensation to employes who seek to become something more than mere mechanical manipulators. When they shall realize this fact and act upon it, we shall regard it as the most important step which has yet been taken towards elevating the telegraphic profession to a higher standard than it has yet attained.

Our Washington Correspondence.

THE session of Congress commences on Monday next and will terminate the 4th of March. The report of the Postmaster General has been made public and contains no recommendation on the telegraph question.

As we have before stated, we do not anticipate any very important action in regard to telegraph matters at this session. We have, however, made arrangements to have THE TELEGRAPHER kept fully informed as to all telegraphic matters of interest that may come up during the session. The communications of our Correspondent CAPITOL will be resumed, and will as heretofore contain the latest and fullest information to be obtained in regard to all telegraphic matters of interest in connection with Congress, not only of the public action but of the secret and private manœuvring which usually, to a greater or less extent, governs such action.

Personals.

Mr. CHARLES H. COTTRILL, recently of the Cable Room at No. 145 Broadway, New York, is engaged at New Orleans, La., with the Associated Press.

Mr. SAMUEL WALLACE is working for the Western Union in Chicago.

Mr. C. H. DAVIS has resigned his position as night report operator at Elmira, N.Y., and gone to Duxbury, Mass., *vice* PERKINS, resigned.

Mr. M. J. LANDY has joined his brother "Billy" in the Cable Room at No. 145 Broadway, having resigned with the A. & P. at No. 197 Broadway, for the above named purpose.

Mr. HARRY GARNER, who has been travelling some time in Canada and through the Eastern States for his health, has accepted a position in the Superintendent's office, Middle Division of the Phila. and Erie Railroad, at Renovo, Pa.

Mr. A. KIMBALL, formerly repairer and battery man for the now defunct P. and A. Telg. Co., and who has been building lines all summer for the Western Union Telg. Co. on the Pacific Division, from Colfax, Colorado, to Sacramento, California, is now acting as repairer at Emigrant Gap, Colorado.

Mr. P. A. ROWE, of the Western Union, Chicago, Ill., night force, and Mr. CHARLES HASELTON, of the Peoria, Ill., Western Union day force, have exchanged situations.

The Telegraph.

By Cable.

STEAMSHIP LA PLATA WRECKED.—HEAVY LOSS OF LIFE.—BRAZILIAN CABLE SUNK.

LONDON, Dec. 2.—The Anglo-Brazilian mail steamship La Plata has been wrecked off the Island of Ushant. Attempts which were made to save the crew and passengers were unsuccessful. Some of the crew had taken to the boats, and one boat, containing fourteen men, has been picked up.

Sixty lives are supposed to be lost.

The La Plata had on board 300 miles of telegraph cable destined for the coast of Brazil.

The Lease of the Franklin Lines to the Atlantic and Pacific Telegraph Company.

THE lease of the lines of the Franklin Telegraph Company to the Atlantic and Pacific Company, as directed at the meeting of the Franklin Company in Boston, already reported in THE TELEGRAPHER, for the term of ninety-nine years, has been completed, and they were turned over to the latter company November 21st. The annual rental finally determined upon was \$27,500.

Some of the stockholders of the Franklin Company appear to be very much dissatisfied with this action of the company, and threaten legal proceedings to attempt to have the lease set aside. It is not probable, however, that anything will be done in the matter.

Removal of the Gold and Stock Telegraph Co. to the new Western Union Building.

THE removal of the Gold and Stock Telegraph Company, from its present quarters at 61 Broadway to the new Western Union building, has now been authoritatively decided upon. This change is a most important one, involving, as it does, the extension of over four hundred line wires, the running of the accompanying inside wires, and the removal of some 4,000 cups of carbon and 2,500 of gravity battery. As the lease of their present premises does not expire until May 1st, the change will probably not be made much before that date. The new location at the corner of Dey street being at so great a distance from the stock and gold markets, it will doubtless be necessary for the company to establish a branch office on Wall or Broad streets, which will be more accessible to subscribers than the main office now is.

New Police and Fire Telegraph Lines in Brooklyn.

A NEW and superior telegraph line has recently been constructed in Brooklyn for the Police and Fire Departments, extending from Fulton avenue, through Reid avenue, to Bushwick avenue; from Reid and Green avenue on Green to Broadway; and from Reid and De Kalb avenues to Nostrand avenue on De Kalb, two and three quarter miles long.

Another line has also been built from the Fifth Precinct Station House through Ten Eyck, Hope, Ewen and Second streets, to Wyckoff street, Williamsburgh (where it connects with their other line), one and a half miles long. The total of new line is five and a quarter miles.

The poles are thirty-five feet in length, with No. 9 English galvanized wire, and screw glass insulators on cross-arms.

Mr. Robert Brown was the contractor and builder, and he is still engaged in filling the streets of New York and Brooklyn with huge telegraph poles.

The Owl Telegraph Company.

PROBABLY few of the readers of THE TELEGRAPHER have ever heard of the "Owl Telegraph Company," and would be puzzled to locate it. It was organized Dec. 27th, 1873, and is in very successful and satisfactory operation. The operators never complain of inadequate salaries, and the stockholders are entirely satisfied with the financial results. This company is composed of a number of citizens of Newark, N. J., and connects the residences of its members, who are thus enabled to communicate with each other for social purposes. The stockholders are the operators, and it is strictly a coöperative concern.

The officers of the company, of which it has as complete a list as more pretentious telegraph organizations, are Mr. Geo. W. Ketchum, President, Mr. J. A. Seaver, Vice-President, Mr. A. D. Chambers, Secretary and Treasurer; Mr. Thos. V. Johnson, Jr., Gen'l Superintendent; and G. A. Van Wagoner, M. D., Electrician.

Mr. Robert Brown, the veteran telegraph constructor of this city, has recently put up for the Owl Company a line commencing at Railroad avenue, Newark,

extending to Broad street: thence with two wires on a four wire cross-arm put up by the company over poles of the Franklin Telegraph Company to corner Central avenue and Summit street, where a new pole line with two wire cross-arms, glass insulators, and best quality No. 11 iron wire, runs to Roseville. A loop leaves the main line in Bank street, extending one and a third miles, and another of half a mile from Summit and Bleecker streets.

The instruments used are the ordinary Morse, which, as before stated, are worked by the parties interested.

Accident to a Cable.

ABOUT one o'clock Saturday morning, at New Brunswick, N. J., a propeller on the Raritan Canal, while passing the draw at the railroad bridge, got caught in the cable laid along the bottom of the canal, and so damaged it as to cut off communication by several wires between New York and Philadelphia. The propeller wheel became so entangled, also, that she was unable to proceed for nearly two hours after the mishap, during which time it was necessary to keep the draw open. The towpath, under which the cable was laid, was considerably torn up. The cable is so badly damaged that it must be replaced by a new one, and meanwhile an extra force of operators are kept on the watch to prevent accidents arising from the difficulty experienced in telegraphing the arrival and departure of trains from the different stations along this portion of the Pennsylvania Railroad.

Foreign Telegraphic Notes.

THE traffic receipts of the Direct Spanish Telegraph, for the month of October last, had amounted to £1,387.

The traffic receipts of the Submarine Telegraph Company, for the month of October last, amounted to £9,509 against £9,565 for the corresponding month of 1873.

The number of messages (of twenty words each) passed over the Barcelona-Marseilles Cable, for the month of October last, was 6,731 against 5,940 messages in the month of September.

Negotiations are in progress for the purpose of establishing an independent cable telegraph line between Australia and Europe. The route suggested is *via* Kimberly, at the south of the Gulf of Carpentaria to Singapore—Sumatra and Java being avoided altogether. The proposal has already received the sanction of the Parliaments of New South Wales, New Zealand and Queensland, and a guarantee of five per cent. per annum on the cost of constructing the lines has been promised by them. The immediate effect of this new line will be to reduce the cost of messages about 33 per cent. between the United Kingdom and her Australian colonies, and, in his last report, Mr. Cracknell, the Superintendent of Telegraphs in Queensland, states that this important work will be commenced without delay.

The traffic receipts of the Great Northern Telegraph, for the month of October, was 438,817 francs, against 360,437 francs for October, 1873. Total traffic receipts, from January 1st to October 31st, 3,770,400 francs, against 2,748,568 for 1873.

The Eastern Telegraph Company's traffic receipts for the month of October, 1874, amounted to £32,858, against £29,229 in the corresponding month of 1873.

The traffic receipts of the Eastern Extension, Australasia and China Telegraph Company (limited) for the month of October, were £16,584, against £17,586 for the corresponding month of 1873.

The Anglo-American Telegraph Company have established themselves in new offices in Throgmorton street, London. The main feature of the new arrangement is that the central office is now connected by special wires with Valentia, and messages handed in at Throgmorton street will be instantly transmitted to the Valentia station, to be despatched thence at once through the cables to America. Messages for New York, the West Indies, and other places on this side of the Atlantic, will now be free from any delay which might naturally arise from their having to take their time with the ordinary business of the English inland postal telegraphic service. The messages received from America in London are at once delivered at their destination by the special messengers employed by the Anglo-American Telegraph Company.

In Bolivia, South America, the telegraph to the North is now working through to Pacasmayo and Payta.

Suicide of a Telegraph Operator.

ON Monday night last Mr. William H. Clark committed suicide at the Hanfield Hotel, Nos. 620 and 622 Grand street, by shooting himself. He was a telegraph

operator, and one of those who had been longest in the service in this city.

He was originally employed on the Erie Railroad lines, under the superintendence of Mr. L. G. Tillotson. Subsequently, however, he succeeded Mr. Henry Bentley in the management of the Madison square office in this city, which position he held until his decease. He was about thirty-six years of age, and leaves a wife and two or three children in Brooklyn. A few months since he lost a daughter, excessive grief for whom may have led him to the tragical termination of his existence.

The Taxation of Telegraph Companies.

THE Supreme Court of Indiana has decided that the tax on \$800,000, assessed on the capital stock of the Western Union Telegraph Company by the State Board of Equalization, cannot be collected. In their opinion, the court say they see no reason why the whole amount of the company's capital stock (\$40,000,000) should not be taxed in Indiana if the \$800,000 assessed can be legally taxed—intimating that the Legislature cannot provide for the taxation of the stock of foreign corporations. From so much of the opinion Judge Buskirk dissents, holding that the Legislature has this power, but that the law under which the assessment is made does not fully cover the necessary ground to be taken.

Statistics of Government Telegraphs for 1873.

THE following table shows the results of the operation of the telegraph in Germany, Hungary, Belgium, Denmark, France, Holland and Switzerland, for the year ending December 31, 1873, being all the reports which have come to hand. It will be observed that the expenditures in these seven countries alone exceed the receipts by \$1,075,510.

Object of Statistics.	German	Hungary.	Belgium.	Denmark.	France.	Holland.	Switzer-land.
Length of lines in miles.....	18,999	8,319	2,926	1,577	30,779	2,039	3,623
Length of wires in miles.....	64,753	2,829	12,561	4,364	79,963	7,278	8,784
Government offices.....	1,469	351	427	108	2,244	149	715
Railroad or private offices.....	1,856	487	120	69	.....	166	85
Total offices.....	3,325	837	547	177	.....	315	800
Interior messages sent.....	7,224,352	2,039,352	1,732,907	240,565	6,022,118	1,309,013	1,641,075
International messages sent.....	1,543,317	92,360	321,524	109,093	887,264	381,766	278,223
Total messages sent.....	8,767,669	2,131,712	2,054,431	.....	.....	.....	.....
Receipts of interior messages.....	\$1,439,230	\$191,092	\$48,732	\$48,732	\$1,503,143	\$171,317	\$182,075
Receipts of international messages.....	1,133,020	\$68,322	181,437	94,594	1,280,145	109,939	136,227
Sundry receipts.....	17,274	29,717	468	3,086	296,237	23,118	23,118
Total receipts.....	2,589,524	618,039	372,937	146,412	3,029,565	283,249	342,320
Extraordinary expenditures.....	368,707	75,035	73,767	35,694	282,000	47,916	36,254
Ordinary expenditures.....	2,892,954	766,151	428,398	194,131	2,938,060	414,976	313,874
Total expenditures.....	3,261,251	840,176	502,165	109,844	2,880,000	461,992	350,128

Train Telegraph Instruments on the Lake Shore Road.

In our issue of October 3d we published the following from the Detroit Free Press:

"Colonel Wheaton, Superintendent of the Kalamazoo division of the Michigan Southern Railway, has provided the train men with a new telegraph instrument, by which connection can be made with the main line at any place and despatches sent. The box is not large, but it affords room for train orders, stationery, one hundred feet of wire, etc. If a train breaks down all that is necessary is to make connections with the main wire, and orders can be sent or received at once."

In relation to this an officer of the road kindly corrects and enlarges the information as follows:

"Each division has been supplied lately with an instrument case, containing telegraph key and box relay connected to posts in the outside of the case, to which wires can be instantly attached. The front of the case forms, when opened, the desk to write on, and there is a drawer for pencil and paper. This case is kept for the use of the telegrapher who accompanies a wrecking train, and enables communications to be established at once. That is all the foundation there is for this puff. Our Superintendent of Telegraph is the person to whom this sensible provision is due, and his modest name is William Kiene, Jr.—The Railway Gazette.

THE telegraph is being introduced into Turner's Falls, Mass. The other day hardly five minutes had elapsed after the erection of one of the posts before some enterprising genius posted a bill thereon, and soon two street Arabs were attracted to the spot, when the following dialogue ensued: "I say, Mickey, what an invention the telegraph is." "Yes, an' here's a dispatch broke out on the post."

THERE is a great difference between an art and a science: an art teaches us to do, a science to know. The object of science is knowledge; the objects of art are works. In art truth is means to an end: in science it is the only end.—W. H. Precece.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

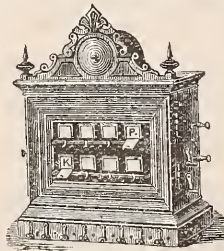
Nov.	WESTERN UNION.	ATL. AND PAC.	AMER. DIST.	GOLD AND STOCK.
			Bid. Asked.	Bid. Asked.
27	80% ... 80% 19% ... 19%	40% ... 40%	62 ... 75	
28	80% ... 81% 19% ... 19%	40% ... 41	62 ... 75	
30	81 ... 81% 19 ... 19%	40% ... 42	62 ... 75	
Dec. 1	81% ... 82 19 ... 19%	40 ... 40%	62 ... 75	
2	80% ... 82 19% ... 19%	40 ... 41	62 ... 75	

Married.

ROWE—WASHBURN.—At South Haven, Michigan, Nov. 5, 1874, at the residence of the bride's parents, Mr. P. A. Rowe, of the Western Union Chicago, Ill., night force, to Miss CARRIE E. WASHBURN, formerly manager of the Saginaw, Mich., Western Union office, and more recently, and up to within the last year, manager of the South Haven, Mich., Western Union office. May they Rowe smoothly over life's too often troubled sea, and all the squalls experienced be only local ones, and any additional sounders only prove harmonious in the din that generally drowns out the old relay's noise. Adjust, Pete.

THAYER—PRAY.—At Philadelphia, Pa., Nov. 12, 1874, Mr. C. W. THAYER, of the Chicago Western Union night force, to Miss HATTIE PRAY, of the former place. We do not anticipate too much when we say that Charlie will always be Thayer (there) as of old, and it will not be necessary to Pray that he work extra any more.

CHAMPION BURGLAR ALARM AND ANNUNCIATOR COMPANY, 40 WEST 18th STREET, NEW YORK.



We invite TELEGRAPH MANAGERS AND OPERATORS throughout the country to act as our agents for the introduction of our superior BURGLAR ALARMS AND ANNUNCIATORS into private houses, hotels, banks, &c. Upon receipt of plans of houses we will send skilful mechanics to estimate upon work, or will give any information in writing that may be required, Liberal commissions will be paid upon any orders that may be secured for us. Our Alarms and Annunciators have just been awarded the FIRST PREMIUM of the American Institute.

Explanatory Circulars will be furnished upon application to the Secretary.

CORNELIUS ROOSEVELT, Secretary and Treasurer, 40 West 18th Street, New York.
L. G. TILLOTSON, President.

PHILADELPHIA.

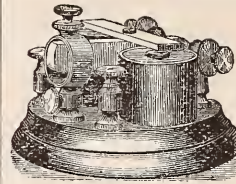
L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of

TELEGRAPHIC AND ELECTRICAL GOODS of every description, at

No. 54 SOUTH FOURTH STREET, (Corner Chestnut street), PHILADELPHIA.

They solicit the patronage of their friends and the telegraphic fraternity generally.



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from, LANNERT & DECKER, 31 1/2 Prospect St., Cleveland, O. Send for circular.



LECLANCHE BATTERIES.

IMPORTANT NOTICE.

After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,

No. 40 WEST EIGHTEENTH STREET; or to L. G. TILLOTSON & CO., 8 Dey street, sole Agents.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with Iron, consists in its LIGHTNESS, relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.

ALANSON CARY, Treasurer,

No. 234 West 29th St., New York.

CHEAP TELEGRAPHY BY THE AUTOMATIC TELEGRAPH CO.

COMPARISON OF RATES.

New York to	By Automatic.	New York to	By Wes'n Union.
TRENTON,	20 words 25c.	TRENTON,	20 words 45c.
PHILADELPHIA,	20 " 25c.	PHILADELPHIA,	20 " 50c.
BALTIMORE,	20 " 25c.	BALTIMORE,	20 " 70c.
WASHINGTON,	20 " 25c.	WASHINGTON,	20 " 70c.

Each additional word 1c. Each add. word, 2 to 3 cents. PROPORTIONATE TO ALL POINTS. UNIFORM TO ALL POINTS.

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LEWIS' TELEGRAPH MANUAL.

A few copies of the last edition of

THE TELEGRAPHIC MANUAL,

by MR. WALTER O. LEWIS, remaining, may be had of F. L. POPE & CO., 38 Vesey street, at fifteen cents each. Will be forwarded by mail postpaid on receipt of price.

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TELEGRAPH INSTRUMENTS AND SUPPLIES,

RELAYS, unequalled for beauty and strength;
 COMBINATION SETS; BOX and POKET RELAYS.
 CHALLENGE, PONY and REPEATING SOUNDERS.
 KEYS, various styles, including the SCHNEIDER KEY, just
 out, no legs, wire connections above the table.
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CUT OUTS, many varieties, including a new style of PEG CUT
 OUT, with an adjustable LIGHTNING ARRESTER, just out.
 REPEATERS—HASKIN'S AUTOMATIC, and others,

SWITCH BOARDS—REPEATING, BATTERY and GROUND SWITCHES
 and LIGHTNING ARRESTERS.
 ANDER'S GALVANIC and MAGNETO-ELECTRIC PRINTERS; also
 SELDEN PRINTER.

ELECTRIC BELLS, HOTEL ANUNCIATORS, FIRE and BURGLAR
 ALARMS, and WATCHMAN DETECTORS.
 ELECTRIC RAILWAY SIGNALS and ALARMS, ELECTRIC GAS LIGHT-
 ING APPARATUS.

MEDICAL INSTRUMENTS and APPARATUS on hand and made
 to order. Second hand Instruments for sale cheap,
 and repairing done at short notice.

BATTERIES in great variety, including the latest inventions;
 also a full assortment of battery material.

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 WIRES, GUTTA PERCHA and KERITE WIRES, BEST GALVANIZED
 LINE WIRES; SUBMARINE, SUBTERRANEAN and
 HOUSE CABLES.

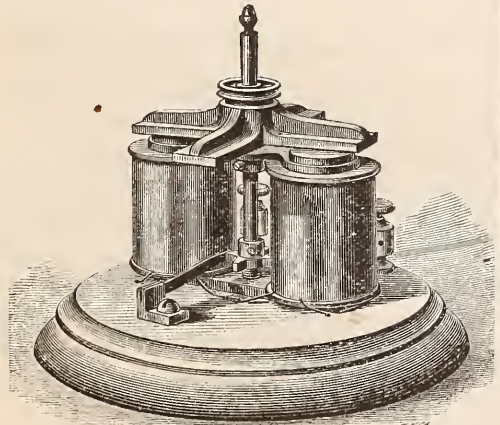
INSULATORS—BROOKS, SCREW GLASS and KENOSHA CARBON.
 BRACKETS, PINS and SPIKES, TELEGRAPH POLES,
 LINE BUILDERS and REPAIRERS' TOOLS.

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 FOLD PAPERS, CARBON SHEETS, STEEL and AGATE STYLUSES,
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Our TELEGRAPH INSTRUMENTS and ELECTRICAL APPARATUS are
 elegantly finished and mounted on highly polished rosewood,
 mahogany and walnut bases.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

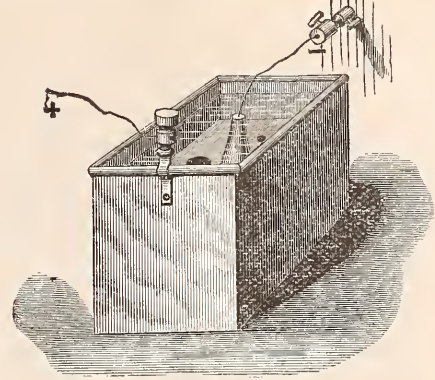
THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine
Run by Electricity!
 It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery..... \$6 00
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May be seen working at the office of the THE TELEGRAPHER.
 For sale by
The Electro-Magnetic Manufacturing Company,
 36 BROAD STREET, NEW YORK.
 P. O. Box 1804.
 Also for sale by
 L. G. TILLOTSON & CO., 8 Dey street.
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A NEW GALVANIC BATTERY.



**Durability, Efficiency, and Economy of Expense
 and Labor at last Secured.**

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.
 The undersigned having secured the exclusive Agency for
 manufacture and sale of the

EAGLES METALLIC BATTERY,
 now offer them to the public as the best Battery for Telegraphic
 and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the
 battery. Sulphate of copper is the only chemical required to be
 used.

These Batteries have been fully tested during the last year,
 although only recently offered for sale, and have proved to be
 superior to any other as regards efficiency, economy and dura-
 bility. When once set up they require no attention for from
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 Two sizes are made at present, but others will soon be ready.

No. 1 is a large square cell, and can be used as a local or for
 running motors. Price, \$2.25.
 On Locals, one No. 1 cell is used in place of two Daniells, at a
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No. 2 is a round cell, designed for main line. Price, \$2.
 Descriptive circulars and price list forwarded upon applica-
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*SUPERIOR TELEGRAPH INSTRUMENTS, RELAYS,
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 OF EVERY DESCRIPTION,
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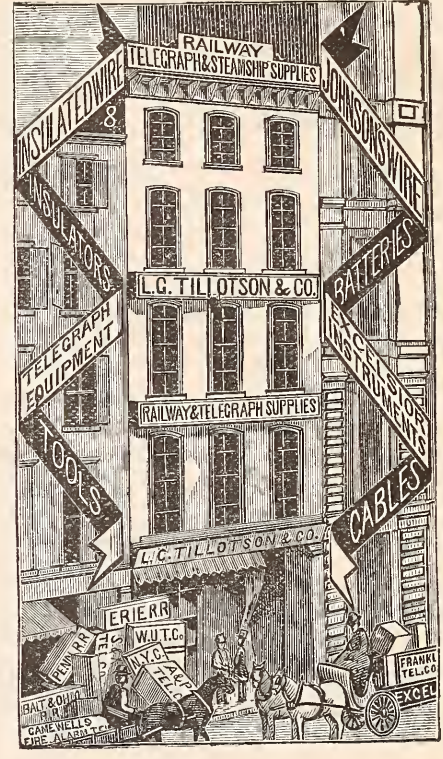
Special attention given to repairing Scientific Instruments.
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Send for their Price List before ORDERING ELSEWHERE.
 Which they are selling at prices to ASTONISH YOU.

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 have a FIRST CLASS STOCK of
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 Send for Circular and Price List. Address,
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 IF YOU WANT
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L. G. TILLOTSON & CO.

They have the **GREATEST VARIETY.**
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 Their **PRICES** are the **LOWEST**
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 THEY GUARANTEE
EVERYTHING TO BE AS REPRESENTED.

They always **RECTIFY MISTAKES** at their **OWN EXPENSE.**
 EVERY ARTICLE REQUIRED FOR THE
CONSTRUCTION AND OPERATION OF LINES
 ALWAYS ON HAND.
 THEIR
EXCELSIOR
TELEGRAPH INSTRUMENT FOR STUDENTS,
 Comprising Sounder and Key, is the greatest
 success of the times.

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SPECIE BASIS REACHED AT LAST!
 We are offering 20 per cent. discount from list prices on all
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AMERICAN FIRE ALARM AND POLICE TELEGRAPH.

GAMEWELL & CO., Proprietors,
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ELECTRICAL CONSTRUCTION AND MAINTENANCE CO.,
San Francisco, Cal.,

Special Agents for California, Oregon and Nevada.

THIS SYSTEM OF

FIRE ALARM & POLICE TELEGRAPH

WITH A CENTRAL OFFICE,

OR

UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which reference is
made for evidence of its great

SUPERIORITY, VALUE

AND

UNIFORM RELIABILITY.

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Charlestown, Mass.,
Covington, Ky.,
Detroit, Mich.,
Dayton, Ohio,
Elizabeth, N. J.,
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Fitchburg, Mass.,
Hartford, Conn.,
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Milwaukee, Wis.,

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New Bedford, Mass.,
New Haven, Conn.,
Newark, N. J.,
Omaha, Neb.,
Philadelphia, Pa.,
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Peoria, Ill.,
Providence, R. I.,
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Rochester, N. Y.,
Richmond, Va.,
St. Louis, Mo.,
St. John, N. B.,
Springfield, Mass.,
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Taunton, Mass.,
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The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

FIRE ALARM TELEGRAPH

IN THE WORLD.

It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

FIRE ALARM AND POLICE TELEGRAPHS,

that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution thereof of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by **MORE THAN TWENTY PATENTS.**

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,
RELIABILITY and
ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION of CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

The cooperation of **TELEGRAPHERS** in securing its introduction into their localities is cordially invited, and

their efforts will be duly appreciated and compensated.

Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

A pamphlet, setting forth more fully its advantages and superiority, has been printed, and will be supplied to Municipal Authorities and others interested in Fire Alarm and Police Telegraphy, upon application as above.

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AND EVERY DESCRIPTION OF

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BUNNELL'S PATENT REPEATER.

These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

JONES' LOCK SWITCH-BOARD,

a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

EXCLUSIVE AGENTS OF

A. G. DAY'S

KERITE,

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

OF THE

HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

We manufacture the Genuine ELECTROPOION BATTERY, with Patent Platina Connection, introduced by us eight years since; also, THE ALPHABETICAL OR DIAL TELEGRAPH, now extensively used in this and other cities for private lines, being easily and quickly learned by any one.

We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

Our CATALOGUE, embracing a large amount of new matter, and description, is now ready for distribution.

BROOKS' PATENT TELEGRAPH INSULATOR WORKS,
 AND AGENCY FOR THE SALE OF
Siemens' Universal Galvanometer,
 Resistance Coils, Submarine Cables,
 AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.

DAVID BROOKS, Proprietor,
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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

Siemens' Universal Galvanometer.

This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

Siemens' Submarine Cables, Cables for River Crossings of every description,
 AND
Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

A SUPERIOR PRINTING TELEGRAPH INSTRUMENT,
 FOR PRIVATE AND SHORT LINES.

Awarded the First Premium—Silver Medal—over all others at Cincinnati Industrial Exposition, 1872.

The undersigned is now prepared to supply the improved and superior PRINTING TELEGRAPH INSTRUMENTS

manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

PRIVATE LINES

constructed in the best and most substantial manner, and on reasonable terms.

Favorable arrangements will be made with line constructors, telegraph employes, &c., for the introduction of the Printer. For further particulars, terms, &c., apply to

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is the most popular brand in the market. This wire is offered on its merits alone. We have never failed to secure the order when placed in competition with other prominent brands. Invoices guaranteed equal to sample, which will be promptly forwarded on application.

INSULATORS OF EVERY DESCRIPTION.

CROSS-ARMS, BRACKETS, PINS, ETC., ETC.

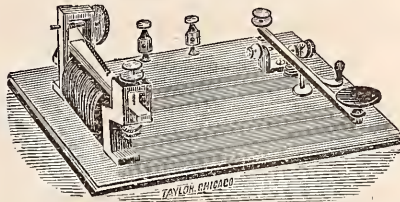
Linemen's Tools always on hand at

No. 47 HOLLIDAY STREET,
 BALTIMORE, MD.

See other advertisements. Send for Catalogue and Price List.

THE AMATEUR'S TELEGRAPH APPARATUS.

(Patented April 16th, 1872.)



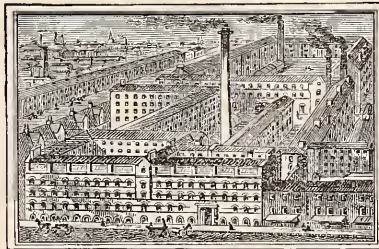
ONE CUP BATTERY, CHEMICALS, WIRE AND MANUAL WITH EACH INSTRUMENT.

Complete outfit for the Student or for short line use.

Price, \$7.50.

Key and Sounder only..... \$6 50
 " " with Lightning Arrester..... 8 00
 Five per cent. discount for cash in advance.

GEO. H. BLISS & CO.,
 41 THIRD AVENUE,
 Chicago, Ill.



MANUFACTORY OF THE SPENCEREAN STEEL PENS, BIRMINGHAM, ENGLAND.

SPENCEREAN DOUBLE ELASTIC STEEL PENS.

The superiority and excellence of these justly celebrated Pens are appreciated, as is shown in their constantly increasing sale. They are comprised in fifteen numbers, of which one number alone has an annual sale of more than 5,000,000.

The SPENCEREAN PENS are manufactured of the very best material by the most expert workmen in Europe, and are famous for their elasticity, durability and evenness of point.

THE SPENCEREAN PENS ARE FOR SALE BY ALL DEALERS.

We make Fifteen Numbers of Pens, differing in flexibility and fineness of point, adapted to every style of writing, as follows:

- No. 1. COLLEGE PEN. Point Fine; Action Perfect. This is a great favorite with our leading penmen, is largely used in the Schools and Commercial Colleges throughout the country, and gives better satisfaction than any Pen before the American Public.
- No. 2. COUNTING-HOUSE PEN. Point Fine and Flexible, well adapted to the use of Correspondents and Accountants.
- No. 3. COMMERCIAL PEN. Point Medium. An Easy Writing Business Pen.
- No. 4. LADIES' EXTRA PEN. Point Extra Fine and Flexible. For Delicate Fine Hand Writing this is a very superior Pen.
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VOL. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawkshee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

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VOL. IV.—A general history of the ancient and modern telegraphic systems, scaphoric and electrical, including telegraphs of Chappé, Le Sage, Ronald, Cooke, Wheatstone, Davy, Steinheil, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

VOL. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

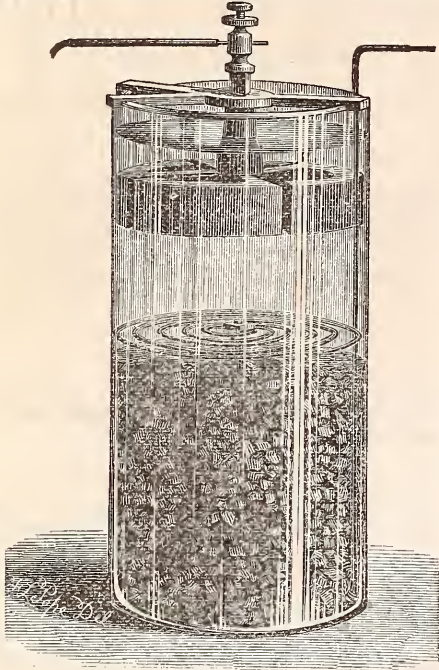
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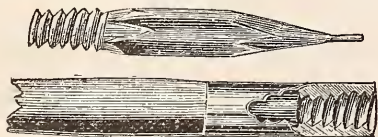
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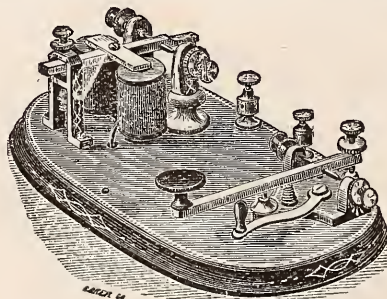
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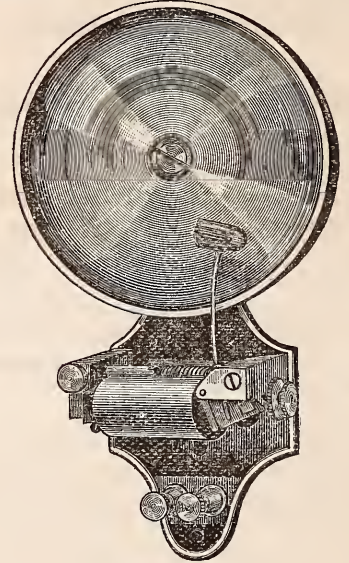
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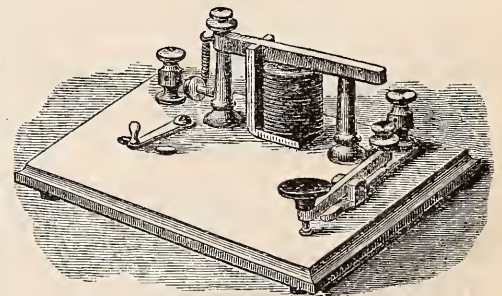
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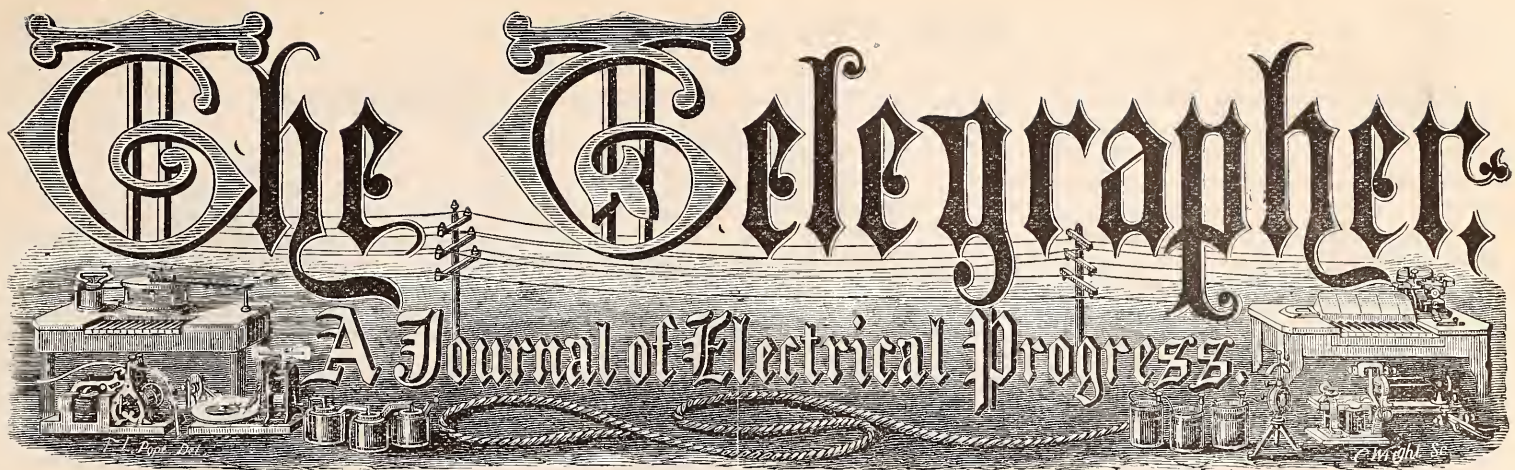
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, December 12, 1874.

Whole No. 439

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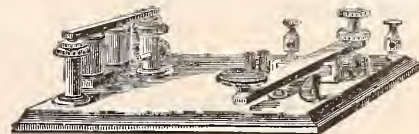
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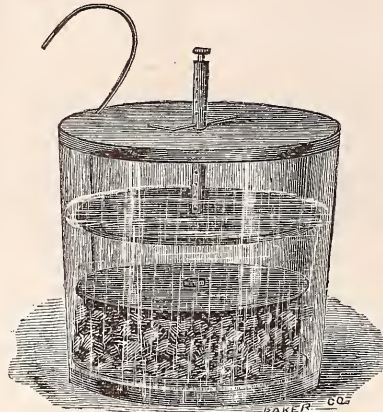
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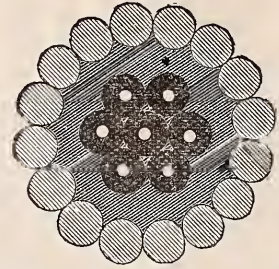
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, - - - - - PUBLISHER.

SATURDAY, DECEMBER 12, 1874.

VOL. X. WHOLE No. 439.

Special Meeting of the Direct United States Cable Company.—Proposition to Lay a Second Cable.

A SPECIAL meeting of the shareholders of the Direct United States Cable Company was held at the City Terminus Hotel, Cannon Street, London, on Monday, Nov. 16th.—Mr. E. H. Lushington in the chair.

In his opening remarks the Chairman said he wished to state the present condition of the cable. The first two sections, namely, between Newfoundland and Nova Scotia, and Nova Scotia and the United States, were both laid down and in excellent working order. The deep sea section was in this position: the Faraday had over 160 miles of deep sea cable to lay, and the Ambassador 150 miles of sbore line. Therefore, he thought they might say that the deep sea line was practically completed, and the observations he might make were based upon that assumption. Dr. Siemens was present, and would be able to answer any question as to the exact position of the cable. He then put the following resolution:—"That this meeting, having in view the importance of duplicating the company's deep sea cable, and in order to enable the directors to provide the funds for that purpose, and for the general occasions of the company, resolved, in lieu of Section 13 of Article 69 of the articles, such section is hereby abrogated, and the following section shall be, and is hereby substituted, viz: No. 13.—"To raise from time to time, in the name and for the purposes of the company, by the issue of debentures upon such terms and conditions as to price of issue, rate of interest, time of repayment and commutation of shares and stocks, and all other respects, as they may think fit, by way of loan, or in any other manner, the sum or sums not exceeding the present capital of the company, with power, however, to reborrow from time to time, in like manner, and within the like limits, for the purpose of redeeming existing debentures or loans, and also to make such payments by way of commissions or otherwise as they may think proper with reference to raising any such sums." He (the Chairman) proceeded to enlarge upon the importance of duplicating the company's deep sea cable. It would be impossible to transmit save from one end at a time. In case of an accident they were not in possession of sufficient funds to conduct the repairs. Then, again, their cable was laid down alongside five other cables, backed by monopolies, concessions and privileges of no ordinary value, to which the public were fully alive, and it would require the utmost punctuality on the part of the Direct Cable Company to carry on a business. Their customers being men of business, whose success depended upon the earliest possible receipt of replies on matters connected with their trading, they would naturally support that company on which they could rely, even at high rates. He was not depreciating the property, he was in favor of conducting the company's affairs with extreme prudence, and that would best be shown by duplicating the line. When they had two deep sea cables they would be able to divide the business with the Atlantic Telegraph Company, and the Anglo-American Company, and make a much handsomer profit, because working with so much less capital. With regard to the more immediate part of the resolution—the raising of the money—he felt sure the meeting would not expect him to state on what terms they should get the money. They must still repose confidence in the board. The money would be raised at the very lowest possible rate of interest, and with every regard to the interests of the original shareholders. The working expenses of an additional cable would be a very small increase on the present cost.

Mr. LEMME said the proposition of the directors had taken the shareholders by surprise, and they had hardly had time to consider the matter. The directors desired to have power to raise money on debentures on the cable which they choose to consider was laid. The shareholders, after the many misfortunes which the cable had experienced, could not take this view of it, and he thought the directors would be asking for money on a cable which was not yet laid. They ventured to suggest that the meeting be adjourned for a month.

Mr. CACQUILLA seconded the amendment.

The CHAIRMAN said that it would then be quite impossible to get the duplicate cable next year. He would suggest the passing of the resolution at once, and the shareholders could then reject it at the confirmatory meeting which would be held in a fortnight, if they found that the cable was not then completed.

Mr. LEMME said he should prefer to adhere to his original amendment, but if the directors desired a fortnight he had no objection.

A SHAREHOLDER expostulated against the inexpediency of raising money at the high rates which they would have to pay till the cable was finished. He should oppose the resolution, and, if necessary, should ask for a poll.

The CHAIRMAN said that no attempt would be made to raise money until such time as the cable was laid. They had deferred holding the meeting as long as possible because they were in hopes that before this time it would have been laid.

Mr. LABOUCHERE said that he was not a scientific man, but that, so far as he understood the question, it was now essentially one of test. He should never, as a member of the board, advocate 15 per cent. being given to raise the money. He thought, with Mr. Lemme, that it would meet their views to take the discussion upon the adjourned meeting, supposing it to be a fortnight, and to lay before them in the meantime all the information for it was very difficult to discuss these matters *coram publico*. The interests of the board and the shareholders were identical, viz., to make the company a great financial success. They had no object with Dr. Siemens, he was only the contractor. He believed that in a fortnight they should be able to lay before the shareholders a good case; then, if they did not like it, they need not confirm the resolution. Then they could consider the steps which should be taken. It would not prejudice matters to pass the resolution at once.

Mr. LEMME replied that he could not withdraw his motion. He had several arguments on his side which he preferred not using at that time.

The amendment for a fortnight's adjournment was then put and carried.

Mr. LABOUCHERE said that if the meeting refused to give the directors the power they asked the directors distinctly stated they were not in the least responsible for the consequences. The object was to get the company in a good position. Their opinions in the matter might be wrong, but if power were refused them the directors would wash their hands of the consequences.

A SHAREHOLDER said that he thought Mr. Labouchere's remarks were uncalled for. The object in postponing the meeting was a very cogent one. If the meeting had been held two months ago the cable would not have been laid. He should hardly fancy that the required delay should have called for the rather threatening remarks from Mr. Labouchere.

Mr. LABOUCHERE explained that his remarks were not intended as threatening. The directors were only anxious to lay the second cable next year.

A SHAREHOLDER asked whether any information had been sought as to whether any other telegraph contractors would or could lay the second cable besides Messrs. Siemens.

The CHAIRMAN said the company was bound to Messrs. Siemens for the second cable.

Dr. SIEMENS said he should confine what he had to say to the remarks which had fallen from the several speakers in reference to the delay which had occurred in laying the cable. It was true that the first cable was ordered rather before that time last year and was not yet handed over to the company. This was owing to circumstances hardly to have been foreseen. The manufacture of the cable was completed to the day at the works. Its insulation was not only equal to specification, but just about double, for instead of the stipulated 160 millions of units per knot it gave 300 millions of units. The steamship Faraday had left within a fortnight of the time intended, but had been delayed at Newfoundland by heavy fogs, and was lost sight of for three weeks, and a report had circulated of her total loss. They were obliged to send the attendant ship to search for her, and the two ships missed, and this had caused much delay. It might be said that the cause of the breaking away of the end of the cable was a fault going overboard, but no cable was ever made without a fault. Every effort had been made to turn out this cable so that it should be surpassed by none. He should not be satisfied unless he handed over the cable to the company in a perfect condition. The delays had been inevitable.

The General Manager confirmed what Dr. Siemens had said as to the care taken in the manufacture of the cable, and the meeting then broke up.—*The Railway News.*

STEADY attention to detail lies at the root of human progress.—*Smiles.*

The National Academy of Science.

THE second session of this body met on November 3, at Philadelphia. The attendance has been large, and includes the names of many of the most distinguished scientists and scholars in the country. We give below brief extracts of such of the papers read as would be likely to interest our readers.

Professor Mayer spoke of the change in dimensions of solid and hollow iron cylinders on their magnetization, and described experiments made on solid and hollow cylinders of iron three feet in length and five or six inches in diameter. He found that solid cylinders elongate on being magnetized, but at the same time so contract in their transverse dimension that the volume of the cylinder remains constant. In the case of hollow cylinders, however, it was found that their interior capacity increased on their magnetization.

Professor Rogers described a simple method of generating positive electricity wherever a steam boiler exists in the building. He attached a pipe to an ordinary boiler used for heating purposes, and carried it through the window to the outer air. To the end of the pipe where the steam escaped he attached what are known as Faraday's nozzles—fifteen of them—with applewood apertures. In front of these nozzles he suspended, by a brass rod, a piece of brass foil, cut so as to present a bristle of points to the escaping steam. He had only to provide an insulating support for the rod, and carry a wire through a pane in the window to a long rod held by ribbon silk in the room where he desired to use the electricity, to have a strong positive current. A tube inserted in the steam pipe, with a valve opening inwardly, admitted air sufficient to produce a uniform condensation of the steam.

Professor Mayer also read an interesting paper on the composite nature of electrical discharges.

Professor Henry read a eulogy upon Joseph Saxton, the inventor of the magneto-electric machine, who died October 26, 1873. Mr. Saxton also invented the locomotive differential pulley; an apparatus for measuring the velocity of vessels; and a metal ruling machine, a contrivance for tracing lines on metal or glass at a minute distance from each other. Mr. Saxton returned to Philadelphia, in 1837, and during his connection with the United States Mint constructed the large standard balances still used in the annual inspection of the assays and the verification of the standard weights for all the Government assay and coining offices of the United States. Mr. Saxton's inventive powers were exercised rather for the pleasure their employment gave him than for any gain to himself. Others reaped the profit from many of his most valuable inventions. He rarely sought to bring into use his devices and discoveries. Among a great many valuable inventions, for which he never received proper credit or any pecuniary return, was that of metallic cartridges.

The meeting adjourned on November 5.

The New Western Union Building.

AS THE New Western Union Telegraph Building approaches completion telegraphers naturally feel much interest in regard to the place which is hereafter to be the business home of so many of them. It is only by a personal examination of the interior of the building that an adequate idea can be obtained of its great extent, and the amount of room which its walls comprise.

The means of reaching the several stories are provided, in addition to the usual stairs, by three large elevators, two of which are operated by steam, and the third is the new elevator, the motive power of which is furnished by water supplied from a tank in the upper part of the building.

It is not necessary at this time to enter into a detailed description of the uses to which the different stories are to be devoted. The receiving department, in which the public generally are most interested, will be in the basement story, which is reached by descending two or three steps from the sidewalk. A large and handsomely fitted up room is being made here for the use of the customers and the accommodation of the numerous persons connected with that department.

Ascending from the street, the first, second and fourth floors are being fitted up and will be rented for offices. A large number of offices will be for rent on these floors.

In the third story are located the executive offices, and from a hasty inspection of them in their present unfinished condition, it would appear as though they would be very comfortably and handsomely provided for.

The operating room, which is in the sixth story, is a very large and excellently well lighted room. All the operators, male and female, are to be located here, and the room is arranged so as to give opportunity for the manager and chief operators to see at a glance every part of the room, and every person employed at the

numerous desks and operating tables. The ventilation of the operating room will be excellent.

The Gold and Stock Telegraph Company will occupy a considerable portion of the fifth floor, and the offices of the New York Associated Press are also to be in one of the upper stories.

The building is thoroughly fireproof throughout, and will be entirely heated by steam, which, for this purpose and for working the elevators, will be generated in immense boilers located in the sub-basement of the building.

It is undoubtedly the handsomest, most extensive, and costly building ever erected for telegraphic uses in the world, and indicates the immense progress and extent of the telegraph business in this country.

It will probably require at least two or three months yet to complete the interior work on the building, and fit it up properly for occupancy by the Western Union Company and the Gold and Stock Company.

New Zealand Telegraphy.

The report of the telegraphs of New Zealand for 1873-74 show continued success and constant progress. The revenue, estimated at £45,000, exceeded that amount by £2,000.

On the 1st November, 1873, the tariff for private messages was reduced to 1s. for ten words, and 1d. for each additional word—address and signature up to ten words being transmitted free of charge. At the same time the Press rates between 8 A. M. and 5 P. M. were made one half the private rate, the charge after 5 P. M. being reduced to 6d. for the first twenty-five words and 3d. for every additional twenty-five. As the alterations in the Press rates involved an advance on the former day rates, provision was made in the new tariff to enable evening papers to receive during the day 200 words of interprovincial news at evening rates, and also to receive, on the arrival of an English or Australian mail, an additional 200 words of either or both at the same rates.

The number of Press messages sent during the year at the reduced rates exceeded those of the previous year about 50 per cent., while the cash receipts for them were nearly £600 less than the corresponding receipts of the previous year.

During the year 752,899 messages of all kinds were transmitted—an increase of 183,939, or more than 24 per cent. over 1872-73.

During the year 8,001 money order messages were sent, representing a total value of £38,052 14s. 9d.—an increase of 2,210 messages and of £9,945 18s. 1d. as compared with the previous year.

The length of line maintained was 2,530 miles, at a cost of £6 3s. 11d. per mile. During the year twelve new offices were opened.

The total earnings of the department for the year were £59,875 0s. 11d., which, deducting the cost of the Signals Department and maintenance of lines, leaves £6,026 6s. as interest upon the capital expended, £249,594 12s. 9d. This result is regarded as highly satisfactory, when it is remembered that it has been secured after reductions in the tariff, as before stated.

At the close of the year 2,530 miles of line, carrying 5,182 miles of wire, were in circuit. It is contemplated to make, during the present year, large additions to this mileage, which is rendered necessary by the increasing business of the department.

Duplex telegraphy has, through the skill and perseverance of Mr. C. Lemon, been successfully adopted, though no details of the system used have been given in the report. It is said to have saved the costly necessity of laying a second cable across Cook's Strait, and to differ, in some important details, from all arrangements for a similar purpose yet worked out in Europe or America.

Mr. Lemon has received the thanks of the Colonial Government.

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

Congress and the Telegraph.—Telegraph Matters in Washington.

WASHINGTON, D. C., Dec. 9.

TO THE EDITOR OF THE TELEGRAPHER.

THE second and final session of the Forty-third Congress commenced on Monday last, and attracted a very large attendance in the galleries, as well as upon the floors of the House and Senate. The members appeared to be in the best of temper and spirits, and the usual congratulations were heartily exchanged. Precisely at noon Vice-President Wilson in the Senate, and Speaker

Blaine in the House of Representatives, called their respective houses to order, and the business of the session commenced.

The reading of the annual message of the President was attentively listened to. There was an absence of any allusion to telegraph matters in it, and, of course, the columns of THE TELEGRAPHER are not the place to discuss its other features.

There seems to be very little interest felt in regard to telegraph matters in Congress, and the postal telegraph schemes are not regarded as likely to occupy much time at this session. They have met with so little popular support, and the financial results in other countries have been so unfavorable, that there is little disposition now to enter upon any such hazardous experiments here.

The only allusion or reference to telegraphs in either House thus far has been the introduction in the Senate yesterday by Mr. West, of Louisiana, of a bill providing for the construction of United States Government telegraph lines between Washington, D. C. and Boston, Mass. The bill directs the Postmaster General without delay to construct a line of telegraph from Washington to Boston, via Baltimore, Philadelphia, New York and Hartford, to be operated in the post-offices of these cities by appointees of the Postmaster General, under such regulations and such rates of tariff as he may prescribe, provided that the rates shall be uniform to all persons, with such uniform reduction to the newspaper press as may be deemed advisable, and provided the rates shall be adjusted to meet and not to exceed the expenses of operating and maintaining the said line, and providing a net income equal to five per cent. interest on the original cost of the same. The bill proposes to appropriate \$600,000 for this purpose. The Senate committees not having been appointed as yet, this, with other bills introduced, was ordered to be printed, and to lie upon the table for reference to the Post-office Committee when appointed.

The Western Union, Franklin and Automatic telegraph companies opened their offices in the capitol, and their location and personnel are about the same as at the last session.

The Western Union offices at the capitol are under the management of Mr. R. W. Bender. The office on the Senate side is in the rear of the reporters' gallery, and Mr. George L. Diven is the operator. On the House side Mr. C. K. Hambricht is operator, and the office is in the rear of the reporters' gallery. The general office of this company is in the main hall in front of the entrance to the House, with Messrs. E. C. Stewart and W. H. Young, Jr., as operators, and Mr. F. T. Avery, clerk. The Western Union Company have altogether twelve instruments in their capitol offices, which are operated by details from the main office as occasion requires. Also have a stock instrument in direct connection with New York.

The Franklin office is in the main hall near the House entrance, and Mr. T. W. Milburn is the operator. The Automatic Company also have an office in this location, with Mr. Hugh Coyle as operator.

Besides these offices there is an office of the Government Departmental Telegraph line in each wing and the main hall of the capitol. That in the Senate wing is operated by Mr. S. W. Conrad; in the main hall by Mr. W. L. Ives; and in the House wing Mr. J. F. Knapp.

In the main office of the Western Union Company here the only additions to the operating force as yet, consequent upon the reassembling of Congress, are Messrs. Del. Marean, Robert Wynne and — Henneburg—the last two from Philadelphia.

So far, I am informed, the business of the telegraph lines has not been anything like what it has been at former openings of the sessions of Congress. The special correspondents of the press are generally using the mails for the bulk of their matter. A train leaves Washington at one o'clock P. M. daily, which arrives at New York about 10 P. M., and this enables the correspondents to forward by it much of the matter which was formerly telegraphed.

The President's message (10,180 words) was sent to the Associated Press by the Western Union lines, and another copy to the Philadelphia Bulletin—the former using seven and the latter eight wires. Time of transmission, one hour for the former and about one hour and ten minutes for the latter. The message was also telegraphed over the Western Union wires to New Orleans, and dropped at several cities on the route.

The Automatic Telegraph Company have extended their line from this city to Georgetown, D. C.

CAPITOL.

Prompt Telegraphing.

TO THE EDITOR OF THE TELEGRAPHER.

WITHOUT any special effort the following was done on the Great Western to-day, Dec. 1st:

At 11:53 A. M. I received a message from Pontiac, Ill., from L. E. K. to C. and M., Joliet, requesting a bid on two cars of new corn. This was taken one block and a half, where one of the firm was met. He came

back to the telegraph office, and at 11:56 A. M. a message had been written by him and O. K. by "Ex." Chicago. At 12:04 P. M. answer came back from Chicago, and at 12:08 P. M. the bid was made to M. K. at Pontiac.

The transmission of the four messages (two of which required delivery) occupied fifteen minutes.

The correspondent at "Ex." was J. P. Cogwin, and at Joliet, Frank Marsh, formerly an operator, now junior partner of the firm of Carpenter & Marsh. S.

Telegraphs and Telegraphers in Chicago.—The Quadruplex, etc.

CHICAGO, Dec. 7th.

TO THE EDITOR OF THE TELEGRAPHER.

ALTHOUGH telegraph business is a little lighter than usual at this season of the year, still the two leading telegraph companies here seem to be doing a good business, working their several forces to their full capacity. The A. and P., under the efficient management of supt. and manager Towler, is daily reaching out and gaining a firmer foothold with the business public.

It is rumored that they (the A. and P. Co. here) sustained quite a loss recently, by their cashier and delivery clerk decamping short twelve or thirteen hundred dollars.

I have good reason to believe this report is well founded, and it is only out of respect for their relatives, who are honorably connected, that I withhold the names of these two young men. Their course has been rather checkered lately, and they must mend their ways mighty fast or they can't expect to "train" with the Chicago boys much longer. We like fun and generosity but no dishonesty.

Despite the large amount of telegraphing done by the A. and P., the Western Union still seem to have lost none of their immense custom, which fact clearly demonstrates that there is business enough for two companies, if rightly managed.

The Great Western Company seems to be on its last legs—no signs of life or business activity around their headquarters. Mr. A. H. Bliss has resigned the general superintendency, which looks very much as if the company was "about played out." An old and well known telegrapher by the name of Knapp has accepted the superintendency.

Mr. Gerritt Smith, assistant electrician of the Western Union Telegraph Company at N. Y., was in town last week, having something to do in connection with the Quadruplex.

Mr. Sam Wallace, who came here recently from Cincinnati, is making hosts of friends, and is in every sense of the word a first class telegrapher, and more—"a gentleman."

Among the rising young telegraphers of our city is Mr. Patsy Tracy, who learned the art in your city at 145 Broadway. He came here from Omaha. He is destined to be one of the finest telegraphers in the country.

Mr. Halligan, of the W. U. office here, who was promoted from "check boy" about nine months ago, bids fair to rank foremost in the profession.

Mr. Hazleton, of the W. U., who came here lately from Peoria, and Mr. Minor C. Gross, of the A. and P., by their gentlemanly deportment and fine talent, are becoming very popular among the fraternity.

Mr. Warner, the inventor of the Warner Relay, has lately been taking unto himself a wife. I was not able to learn the name of the lady.

Charley Robinson, one of the old timers, can be found on the W. U. night staff here.

A week ago to-day Messrs. Jones, electrician, and Plum, chief operator of the W. U. office, finished setting up the quadruplex in the W. U. office here, and began making tests with it. About 4 P. M. Messrs. Plum and Richardson sat down to the receiving side, and French and Drandorf to the sending side, when it worked splendidly to Buffalo. The same evening, I am told, actual business was done—night manager Maynard and Mr. Burton sending, while Messrs. Pettit and Strong worked the receiving side. It worked for about five minutes nicely; after this time, up to Dec. 4th, the tests were very unsatisfactory. Mr. Gerritt Smith, of New York, and Mr. F. W. Jones, of Chicago, worked assiduously to overcome the difficulties manifested at the various tests, and late in the afternoon of the 4th a balance was struck, and Messrs. French and Hurd, on the sending sides, and Bale and McCreesh on the receiving sides, done about sixty messages, taken promiscuously out of the business of the day, in fifteen minutes. In the evening of the same day it was worked continuously from 9 until 12 P. M., and the business of nearly four Morse wires, worked up to an ordinary capacity, was transacted; Messrs. Root and Whitford sending and Stone and Francis receiving. Those having the matter in charge consider it a success.

The 4th night, with propriety, be called a gala day in the W. U. office here, as, besides the successful working of the quadruplex, they were honored by Kalakaua, King of Hawaii, talking from San Francisco

through the office here with President Grant and Secretary Fish at Washington, D. C.

It was quite amusing, I am told, to see the long faces and hear the pitiful excuses poured into manager Maynard's ears a few nights ago by the night men on the W. U. night force who thought they were late. The joke was played on them by the Howard electrical clocks in the office, all of which, about 5 P. M., took a jump of about seven minutes. A great many of the electricians in this section consider the Howard clock, as at present constructed, very unreliable. It seems to work on the principle that it is one minute only past any given time until it is five minutes past. When the hands do move they move two minutes at a time. The New York electrical clock seems to be more favorably thought of, as it shows a second hand on its face and keeps accurate time to the second.

OCCASIONAL.

The Pursuit of Pleasure Under Difficulties.

WISCONSIN, Dec. 2.

TO THE EDITOR OF THE TELEGRAPHER.

THE following experience of a telegrapher in the pursuit of pleasure under difficulties may interest some of your readers:

At 8:30 o'clock P. M. five gentlemen met at the rooms of one of our party (of whom the writer was one), for the purpose of going to a country sociable, a few miles from the city, as had been arranged between the ladies and ourselves. When ready to go for our conveyance, which, by the way, was to be an omnibus, we found that two of the proposed party, a gentleman and lady, had calculated to remain at home and have a little private sociable of their own. Probably some of your readers know by personal experience the pleasures of a private sociable of that kind, and those who do not would do well to come here and learn.

Well, now that our party consisted of but four couples, we concluded to take two double carriages instead of the 'bus. Accordingly, we hurry off to the livery stable to make the change, as it involved no additional expense. Arrived at the stable we find the horses hitched to the 'bus, ready to start, and hold another consultation as to whether we shall put the proprietor to the trouble of disconnecting the horses from the 'bus, and fix up two separate carriages for us. We finally decided (as it proved a painful mistake) to take the 'bus, as we could have a much jollier time, as we supposed, by all going together in one conveyance. At 9 o'clock P. M. we four gentlemen pile into the 'bus, and proceed to collect the ladies of the party from their several abodes, and by the time all are gathered in, and we are fairly on our way to the scene of our proposed festivities, another half hour is gone, and the windows of our vehicle are fast getting loosened, and rattling away at the rate of fifty words (I should guess) to the minute, with nary a space.

Have any of the readers of THE TELEGRAPHER ever rode in an omnibus over a rough country road? If so then they can perhaps sympathize with us. Those who have not can get a faint idea of the tremendous din those windows were making by putting a few hundred tin cans into a large box and shaking them up pretty lively; and then imagine us trying to entertain the ladies amidst the noise! Oh! how I sighed for an ear trumpet and a speaking trumpet. But, unfortunately, the noise was not the worst that we had to endure on this memorable excursion. It was the road. Oh, that road! It makes me sympathetically caress my sitting down place even now when I think of it. It was up hill and down, out of one rut and into another, until I thought I should certainly need a half sole on my stern by the time we got out of that 'bus. And, oh, our poor fingers! I say our because the young men all asked me if my fingers were as sore as theirs, and they were, I think, if anything, a little more so. Does the reader ask what made our fingers sore? It was digging them into the cushions of the seat to keep from sliding off when crossing those execrable ruts. When we could not conveniently get hold of the cushions we did the next best thing—that is, caught hold of the ladies. They, however, did not take kindly to that, and we could not make them believe that it was to help hold them from sliding off the seats, so after a few attempts we had to abandon that attempt.

Finally, we got to our destination, and had a very pleasant time, and with a repetition of our former experience ultimately reached home again; and all tried to think that we had enjoyed ourselves very much, but for the next few days I could not use my fingers with much comfort, and, in fact, every time I sat down for a week afterward was painfully reminded of my ride in a 'bus to the sociable in the country.

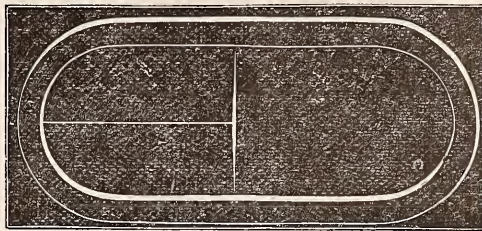
The driver informed me next day that he found a couple dozen of hair pins and four newspapers in the 'bus, one of which was THE TELEGRAPHER. How they got there I will not endeavor to conjecture, but they certainly were not in the omnibus when we started from the livery stable.

OWTON A. FOUL.

Coil for the Sine Galvanometer.

TO THE EDITOR OF THE TELEGRAPHER.

In order to render the needle of the Sine Galvanometer more easy to balance I construct a narrow coil in the shape of an elongated ellipse, its least diameter being a little more than the length of the needle, and its greater diameter about three times the length of the needle. The accompanying figure shows a coil and



needle of about these proportions. The object of the arrangement is to consolidate the magnetic field of the coil so that the needle will swing nearly out of its influence at each oscillation. No part of the coil has any influence on the needle except the parts directly opposite the ends of the needle, the other parts being too distant.

R. J. HEWETT.

Osage City, Mo., Nov. 24th, 1874.

Mr. Bear on Verbal Jugglery.

MITCHELL, IOWA, Nov. 12.

TO THE EDITOR OF THE TELEGRAPHER.

"Mr. BEAR now explains that he was mistaken in stating that 'two like currents pass each other on same line in opposite directions,' and says he 'should have said two unlike currents, or omitted the word like, and that his reason for using the word was because like poles or plates of batteries are connected to line at ends. It would now be in order for him to 'rise and explain' how like poles can produce unlike currents!"—*Journal of the Telegraph.*

Again I am mistaken! Now, what shall I say—neutral? Does he mean that a current flows from zinc plate of battery direct to lines, or from both end plates of a battery to line?

In my last published diagram, now under discussion, similar plates are not connected to line at same end. Then, if a current flows to line from one battery, will not also a current flow to line from a similar plate of the other battery at the other end of line, if each has a ground wire at the opposite end of line by which to pass to earth.

If "like" and "unlike" both are wrong, then I'm done on this point, having learned the new axiom that two currents are neither alike nor unlike! Or has there lately been a third kind of a current incubated in the *Journal* laboratory? If so, then we may with propriety call it a *neuter gender electrical equine!* No wonder they have a four horse team.

How many kinds of electrical currents?—Answer. Three: positive, negative and neuter.—*Journal Text-book.*

I have never yet found a battery with practically two currents, but I have found that with two batteries connected to the same wire, the two currents could be passed in opposite directions, and I considered them as *relatively* positive and negative.

Perhaps the readers of the *Journal* are satisfied with only one side of its discussion with one who was so unworthy as to be editorially kicked out of its columns. I had hoped to meet it with line for line, but with its three kinds of battery currents no wonder it mixes things equal to a country pettifogger, and goes for me "in a way that is childlike and bland!"

Now, if this is not enough, I may have occasion to call attention to the file of the *Journal* for 1869, in which that eminent electrician, Mr. George B. Prescott, advocated strongly the principle of two non-interfering currents on the same wire.

BEAR.

A "Little" Too Much.

TO THE EDITOR OF THE TELEGRAPHER.

I DO not wish to find fault with the management of THE TELEGRAPHER, in fact its general management and conduct is perfectly satisfactory, but on behalf of your numerous readers I submit to you whether you are not giving us just a little too much of Mr. George Little, C. E. Understand me, that I am not criticising Mr. Little's Automatic Telegraph System, which I am perfectly willing to concede is the perfection of all telegraphy, but it does seem to me that unless Mr. Little can give us some new ideas that it would be more becoming in him, and certainly more interesting to the larger part of your readers to occupy your columns less frequently. For one, and many others have made similar remarks, I am not intensely delighted or interested in the list of his various patents, of which he informs us

he has a remarkably large number, or the repetitions in different communications and "original articles" of their claims. All that may do very well for two or three times, but it is getting monotonous, and, as the boys say, do "give us a rest."

Mr. Little seems to be in a perfect state of combativeness towards a party named Edison, and whenever E. projects his unfortunate cranium Little seems desirous of mashing it with a (literary) club. Now, I have no sympathy with Edison—in fact, from what I have heard in regard to him, and from what has appeared editorially in THE TELEGRAPHER, I think his moral and telegraphic turpitude must be conceded, but why harass our feelings with duplex reviews and refutations of statements and assertions of which otherwise we should never hear? Would it not be better for Little and Edison to meet in some retired spot and physically or scientifically annihilate each other? At any rate such a disposition would relieve the public from participation in their difficulties.

The communications of another correspondent of THE TELEGRAPHER, Mr. D. H. Craig, are much more lively reading, and if we must regard him as rather extravagant in his claims and assertions, he manages to make them more readable and interesting. In common with many others, I have been greatly attracted to that "ten year old child" who performs such remarkable telegraphic feats, and hope he (or she) is well and making progress. I have no animosity towards that child, although threatened with superseding my telegraphic functions by such "cheap labor." I notice, however, that Mr. Little disavows the paternity of the "ten year old," and goes in for skilled talent and good pay in telegraphy. In that, at least, his head is level.

Well, I had better wind up this epistle or your other readers (of course I regard my own literary productions with complacency) will consider me as a great bore also, and will eventually desire a rest, too, from

A COUNTRY PLUG.

A Remarkable Occurrence.—A Night Operator on C. P. R. R., of California, Promoted to an Agency.

CALIFORNIA, Nov. 26.

TO THE EDITOR OF THE TELEGRAPHER:

MR. ALFRED CLARKE, night operator at Cisco, C. P. R. R., Sacramento Division, has been promoted to station agent at Summit, same division. The promotion of a night operator to an agency on this division is a very remarkable occurrence, and deserves mention.

T. E. LEGRAPH.

Miscellaneous.

TIME BY TELEGRAPH.—The telegraphic apparatus at the Naval Observatory at Washington is now connected with the main lines of the Western Union Telegraph Company, so that not only is the time ball dropped daily at noon, but the same signal is widely distributed by the telegraph company. It goes directly from the Observatory to the main office in New York city, and thence it is sent to nearly every State in the Union. The immediate object of these signals is to furnish accurate and uniform time to the railroads, and throughout the whole vast territory in question there is scarcely a train whose movements are not regulated by the Observatory clocks. The clocks at the Navy Department, at the Army Signal Office, at the Treasury Department, and at the Western Union Telegraph Company's offices, are all directly controlled by electric currents sent every second by the standard clock of the Observatory.

A NEW FORM OF ELECTRO-MAGNET.—A contributor to the *English Mechanic* thus describes an electro-magnet constructed upon a novel plan and possessing a power far greater than those of the ordinary type:

"First, I took a number of pieces of iron wire, 16 gauge and 12 in. long, and commencing half an inch from the end, I wound fine silk-covered wire (as used for the secondary in coils) for 2½ in. down, then gave two or three long turns, carrying the wire to within 3 in. of the other end, and wound that in the same manner as the first, and leaving long ends of the fine wire for subsequent attachment. The covered wire was then dipped in a spirit varnish and put aside to dry. When I had covered a number of these I bent them up into the form of a horse-shoe magnet, and put round them a number of pieces of similar wire, but uncovered, so that I had a horse-shoe magnet much resembling the bundle of wire in the core of a 'coil.' The whole lot were then wound with eight coils of 16 gauge covered wire in the usual manner, and all the ends of the fine wires soldered to the outside copper wire. The result quite surprised me, and no doubt will be of some use to those who do not mind a little trouble for the sake of a superior article.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

SATURDAY, DECEMBER 12, 1874.

THE TELEGRAPHER:

PUBLISHED EVERY SATURDAY at 38 VESEY ST.

TENTH VOLUME.

TERMS OF SUBSCRIPTION.

One Copy, One Year, - - - - \$2.00.

INVARIABLY IN ADVANCE.

Single Copies Five Cents.

SPECIMEN COPIES FORWARDED FREE on APPLICATION.

Communications must be addressed to

J. N. ASHLEY, Publisher,

(P. O. Box 5503.) 38 VESEY ST., New York.

EXTRA INDUCEMENTS TO OBTAIN SUBSCRIPTIONS FOR THE TELEGRAPHER.

It has been customary, at this season of the year, to offer PREMIUMS to those who may be willing to make special exertions to procure additions to the SUBSCRIPTION LIST OF THE TELEGRAPHER. In pursuance of this custom, the following

LIBERAL LIST OF PREMIUMS,

which it is believed will prove satisfactory to the friends of the paper, has been prepared, and we have no doubt will meet with the same general favor and acceptance as previous similar offers have done.

THE TELEGRAPHER is the only generally recognized and established representative of the

TELEGRAPHIC FRATERNITY

in the United States and the Dominion of Canada, and, as such, has long enjoyed the confidence and approval of the great body of the telegraphers. Every effort has been and will be made to not only maintain but increase its

VALUE AND EFFICIENCY.

It is no ephemeral publication, but is a successful and firmly established journal, as is demonstrated by the fact that it has regularly appeared for

MORE THAN TEN YEARS,

having been enlarged from time to time, as its increasing patronage has warranted.

It is hoped that, recognizing the value and importance of the paper, the telegraphers generally will renew their efforts to immediately and largely

INCREASE ITS CIRCULATION.

To give everybody a chance to

PARTICIPATE IN THE PREMIUMS

the following offer is made:

FOR TWENTY SUBSCRIPTIONS,

to the person forwarding the names and money a No. 1 TELEGRAPH SOUNDER, or NOAD'S STUDENT'S TEXT-BOOK and CLARK ON ELECTRICAL MEASUREMENT, or any other Electrical or Telegraphic works of equal value.

FOR FIFTEEN SUBSCRIPTIONS,

THE FAIRY ELECTRIC ENGINE, or a set of F. L. POPE & Co.'s popular NONPAREIL TELEGRAPH APPARATUS.

FOR TEN SUBSCRIPTIONS,

an elegant Gold TELEGRAPHER'S BADGE PIN.

FOR SIX SUBSCRIPTIONS,

a No. 3 TELEGRAPH KEY; new and elegant pattern.

FOR FOUR SUBSCRIPTIONS,

a copy of THE TELEGRAPHER one year, or F. L. POPE'S MODERN PRACTICE OF THE ELECTRIC TELEGRAPH.

FOR TWO SUBSCRIPTIONS,

one of the new and popular SNAPPER SOUNDERS, introduced by Mr. R. W. POPE, with a HARD RUBBER KNOB.

For the Books offered above any other work or works of equal value will be sent if desired.

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TWO DOLLARS PER YEAR,

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Those who send subscriptions for premiums should state that fact.

Subscriptions may be sent in as obtained, and more names added from time to time, and the Premium claimed for the whole number when desired.

All letters and remittances must be addressed and made payable to

J. N. ASHLEY,

P. O. Box, 5503.

Publisher.

Special Notice.

FROM and after January 1st, 1875, the United States postage on THE TELEGRAPHER will be prepaid by the publisher. Notwithstanding the additional expense the price of subscription will remain as heretofore, Two Dollars per annum, payable in advance.

Hereafter it will not be necessary for subscribers in the British North American Provinces to remit the additional twenty cents heretofore required for the prepayment of the United States postage.

Send in the Subscriptions.

IN order that there may be no delay in forwarding subscriptions to THE TELEGRAPHER, until the commencement of the new volume, we have decided to renew our liberal offer of last year. Any subscriptions or renewals of subscriptions received, will be commenced with the first number of Vol. XI, which will appear January 2, 1875—the remaining numbers of the present volume being furnished to such subscribers gratis. This liberal proposition, in addition to the prepayment of postage from the commencement of the New Year, will no doubt insure speedily large additions to our present subscription list.

Indications of Renewed Prosperity to Telegraphic Interests.

THE causes which have led to the very general suspension of telegraphic construction and extension during the past year are, of course, mostly of a temporary character. With their removal or cessation there will be a return of activity in this as in other branches of business. We anticipate this will be partially the experience of the next year. There will, without doubt, be much more new telegraph lines constructed in 1875 than there has been in 1874.

One great obstacle to telegraphic progress has, we think, been pretty effectually disposed of for some years to come. The danger of Government confiscation of telegraph property, if it ever had any real existence, is probably over. The people have manifested no approval of the projects for Government control or ownership of the telegraphs of the country, and the Treasury is in no condition to warrant any hazardous experiments in that direction. It is, therefore, hardly probable that even Mr. GARDINER HUBBARD will be able to reopen this winter the HUBBARD and ORTON debating society, as heretofore.

The financial depression succeeding the panic of the fall of '73 completed the work which the protracted and sometimes threatening discussion and pressure of the postal telegraph policy had commenced, and, probably, a less amount of new telegraph line has been constructed in the United States during the present year than in any previous year for a long time. It has been almost impossible to obtain money for new enterprises, and those companies already in operation wisely suspended progress for the time. The Western Union Company having decided to adopt the policy of paying dividends, which had been so long suspended, was necessitated to husband its resources for that purpose, and, therefore, has done little more than to keep the existing lines in operation. Of course it cannot continue this policy; extensive as are its lines, and the territory they cover, they must be supplemented and increased by other wires over new routes and territories, and additional wires on routes already covered.

As is elsewhere noted, the Atlantic and Pacific Telegraph Company is preparing for a fresh and vigorous start in the spring, and has quite an extensive programme of extensions under consideration. Other companies will also extend to a greater or less extent, so that we believe that the aggregate of construction, additions and reconstruction, for the next year, will aggregate a very respectable amount.

It is true that the business depression and stagnation is not yet passed, and that its effects must continue for some time to come. But the outlook for the future is encouraging, and when the winter is over we believe that there will be a considerable revival of general business. It is not to be expected that the seeming prosperity and intense speculative activity which was so rudely checked by the panic of '73, will be renewed during the coming year, but we believe that there will be a gradual and healthy revival of business, which in turn will warrant and demand an increase of telegraphic facilities.

The efforts to transfer the Atlantic and Pacific lines to Western Union control having been checkmated, the prospect is that the competition between the companies and their allies on each side will be very active in the future; and if this shall be conducted with reasonable regard to the interests of the stockholders and of the employes, it will no doubt prove beneficial. Fair and honorable competition for the telegraph business of the country is to be desired, but experience has shown that the cut-throat policy is not ultimately advantageous to anybody.

In view of all the circumstances and conditions, present and prospective, we think it may be safely concluded that the worst is about over, and that the telegraphs of the country are about to enter upon a season of renewed activity and prosperity. If in this we are correct it will indeed be pleasant information to many who have found their occupation and emoluments restricted, and sometimes entirely taken away from them during the past year. It is a promise of remunerative employment for line builders and manufacturers of telegraph material, apparatus and instruments, and of a greater demand for telegraphic service, which shall take up some of the surplus telegraphic labor now seeking employment or drifting temporarily or permanently into other occupations. It is furthermore an unmistakable indication of the returning and reviving prosperity of the country.

We must not, however, jump to the conclusion that all this is to be immediately realized. The winter months must be gone through with, and they are likely to prove hard and trying ones to telegraphers as well as to others. Telegraphic labor is in excess of the demand, and those who have situations will do well to stick to them, if possible, until there is a certainty of bettering their condition. Those who have employment must aid, as far as possible, those who have neither employment or money. We must help one another to bear the burdens of the day, and look forward hopefully to the good time which is coming, it is to be trusted, in the now not very distant future.

Not Exactly the Fair Thing.

Our attention has been called to what purports to be a reprint in the *Toronto Globe*, of Nov. 24th, of an editorial article from THE TELEGRAPHER of Nov. 7th, on "Excellent and Successful Telegraphic Management and its Result." In this article, as it appears in the *Globe*, the following paragraph is omitted, which refers to the competition which the Montreal Telegraph Company has had to encounter:

"During its existence several competing telegraph companies have been organized, and the Dominion Telegraph Company, now in successful operation, is by no means a competitor to be despised, and is pursuing, under its present management, a policy similar to that of the Montreal Company, and with satisfactory results. The Dominion Company is yearly extending its lines, and the season now closing will have added 700 miles of line to that which it previously had. This company is also paying dividends regularly to its stockholders—that for last year, and we believe for the year previous, having been at the rate of 5 per cent. In fact, telegraphic enterprises that do not pay dividends are not much in favor with our Canadian friends."

In the next paragraph, the word "those" is altered to "that," which is required to make sense after omitting the previous paragraphs, but which materially alters

additional lines on some routes should be undertaken, and the wires on existing routes should be increased, which will involve the expenditure of a considerable amount of money, the Trustees deem it the best policy to provide for this expenditure by the issue of the reserved stock of the company rather than by incurring indebtedness, as would otherwise be unavoidable.

Foreign Telegraphic Notes.

On Tuesday, Nov. 17th, the steamer Norseman, belonging to the Western and Brazil Telegraph Company (Limited), left the Thames with the shore end portion of the cable to be laid, in the interest of the Central American Telegraph Company (Limited), between Demerara and Cayenne, the remainder of the section following shortly in the steamship Hooper.

In his speech to the Legislative Council of Western Australia, the construction of a telegraph line to South Australia was recommended by the Governor.

A SHORT time ago it was announced that the British Post-office was about to introduce a new and smaller form for telegraphic messages, and that the saving thereby secured would be somewhere about £30,000 a year. The improved form is exactly half the size of that hitherto in use, but no diminution of public convenience will result from its introduction, for the same number of writing spaces has been provided, the economy in size being gained by the compression of certain official particulars relating to the preamble of the message, and the transfer of the general instructions from the front to the back of the form.

Telegraphic and Electrical Brevities.

In his Annual Report the Secretary of War states that the line of military telegraph from San Diego, Cal., to Prescott and Tucson, Arizona, provided for by the Act of 1873, which appropriated, upon an estimate of this department, \$50,311 80 for its construction, was built by labor of troops, using the means of transportation of the Quartermaster's Department. The line is 540 miles long, and cost \$45,000. The balance of the appropriation remains unexpended. As a surplus of wire remained unused on the completion of the line, it was used to extend the telegraph to Camp Verde. By this line, cheaply constructed, the principal posts in Arizona are placed in immediate communication with each other and with the headquarters of the Department of Arizona, of the Military division of the Pacific, at San Francisco, and with the War Department.

The new telegraph through Staten Island, New York, is rapidly approaching completion, and will soon be in operation, with offices at the various ferry landings, and an intermediate one at the County Clerk's office in Richmond.

The Highest Telegraph Station in the World.

THE Western Union Telegraph Company opened offices at Denver, December 7th, at Fair Play and Alma, Colorado. The latter place is supposed to be the highest regular telegraph station in the world, being ten thousand five hundred feet above the level of the sea.

Death of Ezra Cornell.

MR. EZRA CORNELL, whose name is indissolubly connected with the introduction of the magnetic telegraph in this country, died on Wednesday last, Dec. 9th, at Ithaca, N. Y., after a brief illness.

The following brief obituary is from the New York Commercial Advertiser:

Ezra Cornell was born at Westchester Landing, Westchester County, January 11, 1807, of Quaker parentage. His father was a potter, and young Ezra assisted him at Tarrytown, and afterwards in Madison county, where they removed in 1819. The advantages of early education then were small, but the boy made the most of them. In 1826 he left home to work for himself, and found employment at Homer, but removed to Ithaca in 1828, where he worked in the machine shop of a cotton factory at eight dollars per month and his board. He worked alternately at agricultural and mill work until 1842, when he became interested with F. O. J. Smith and Professor Morse in telegraphic enterprises. He was appointed Assistant Superintendent of the line between Baltimore and Washington, and first suggested the substitution of poles for the pipe that was originally intended. In 1845 the line was extended to New York City, and Mr. Cornell was put in charge, and in the same year he superintended the construction of a line of telegraph from New York to Philadelphia. In 1846 he constructed a line to Albany, and another in the year following from Troy to Montreal. By these operations he made money, and having faith in the telegraph he invested it largely in stock, and so reaped a fortune. Honors came to him also. In 1863 he was a member of the Assembly, and in 1864-5 a State Sen-

ator. But the crowning glory of Mr. Cornell's life is the University that bears his name. He endowed the college with the munificent gift of \$760,000, and also took upon his own shoulders the location and sale of the agricultural land scrip with such success that the ultimate endowment from this source will probably reach \$2,000,000. Ithaca owes to him a public library with an endowment of \$50,000. Ezra Cornell's life was not only busy and honorable, but most useful to his fellow men. He has left such an example of a noble life as best illustrates the genius of our free institutions.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Dec.	WESTERN UNION.		ATL. AND PAC.		AMER. DIST.		GOLD AND STOCK.	
	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.
3	81 1/4	82 1/4	18 1/2	19 1/2	40	40	62	75
4	82 1/8	82 1/2	19 1/4	19 3/4	40	40	62	75
5	82 1/2	82 3/4	19 1/2	19 3/4	39 3/4	40 1/4	62	75
7	81 1/2	82 1/2	19	19 1/2	39 3/4	40 1/4	62	75
8	82 1/2	82 3/4	19	19 1/2	39 3/4	40	62	75
9	82 1/2	82 3/4	19 1/4	19 1/2	...	40	62	75

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st 1871, including drawings, specifications and claims in full sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended November 17, 1874, and bearing that date. 156,843.—DUPLEX CHEMICAL TELEGRAPHS. Thos. A. Edison Newark, N. J., assignor to himself and Geo. Harrington, Washington, D. C. Filed March 13, 1873.

Two opposing batteries constantly in circuit through receiving instrument, when not transmitting, neutralize each other. When transmitting one is short circuited by transmitter, leaving other to neutralize outgoing main current in home receiving instrument.

The local batteries u and v or w and x in a shunt from the main line and opposing each other, and a connection between them to the transmitting or receiving instrument, in combination with the main batteries, resistances and circuits, arranged substantially as and for the purposes set forth.

Died.

MCCONNELL.—At Marshalltown, Iowa, Dec. 3d, 1874, of consumption, HARRISON MCCONNELL, late operator Cedar Rapids, Iowa, office, aged 26 years.

A CARD.

THE METALLIC GALVANIC BATTERY.

A NOTICE having been extensively published and circulated announcing the appointment by Edwin Eagles of another firm as sole agents for the manufacture and sale of the Metallic (or Lead) Galvanic Battery, known to the trade as the "Eagles Metallic Galvanic Battery," and enjoining all other parties from manufacturing or selling the battery, we take this method of informing the public of our position and rights in regard to said battery.

At the time the notice referred to was prepared and published it was well known to Eagles, as well as to us, that his application for a patent on the battery had been rejected more than a year previous, on the ground that the applicant was not the original inventor.

The original inventor of the battery now has an application pending in the Patent Office for a patent on his invention, which we have no doubt will be granted, and which, when issued, will be controlled by us.

In any case the notice is preposterous, as in no event can a valid patent possibly be issued to any other than the original inventor.

We continue and shall continue to manufacture and sell said Metallic Galvanic Battery, and parties purchasing of us will be fully protected in their right to sell and use the same.

Those who may purchase this battery manufactured by other parties not authorized by us, will be, after the issue of the patent, legally liable to pay royalty to us on battery so purchased from or made by unauthorized parties.

The Metallic (Lead) Galvanic Battery may be had of us, or from Messrs. L. G. TILLOTSON & Co., who are our agents for its sale, at our prices, and who will guarantee against infringement in any battery that they sell.

F. L. POPE & CO.,

New York, Dec. 9, 1874.

38 Vesey Street.

PHILADELPHIA.

L. G. TILLOTSON & CO.

beg to announce the opening of an establishment for the sale of

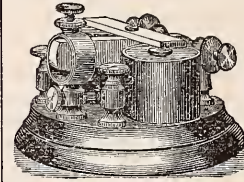
TELEGRAPHIC AND ELECTRICAL GOODS of every description, at

No. 54 SOUTH FOURTH STREET,

(Corner Chestnut street,)

PHILADELPHIA.

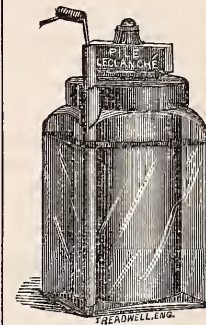
They solicit the patronage of their friends and the telegraphic fraternity generally.



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from,

LANNERT & DECKER, 31 1/2 Prospect St., Cleveland, O. Send for circular.



LECLANCHE BATTERIES.

IMPORTANT NOTICE.

After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,

No. 40 WEST EIGHTEENTH STREET;

or to

L. G. TILLOTSON & CO.,

8 Dey street, sole Agents.

AMERICAN COMPOUND TELEGRAPH LINE WIRE.

COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

The superiority of the COMPOUND TELEGRAPH WIRE compared with Iron, consists in its LIGHTNESS, relative TENSILE STRENGTH, CONDUCTIVITY DURABILITY, EFFICIENCY and RELIABILITY.

Address, American Compound Telegraph Wire Co.

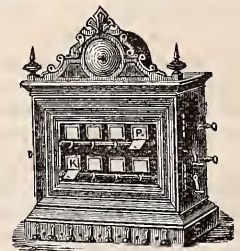
ALANSON CARY, Treasurer,

No. 234 West 29th St.,

New York.

CHAMPION BURGLAR ALARM AND ANNUNCIATOR COMPANY

40 WEST 18th STREET, NEW YORK.



We invite TELEGRAPH MANAGERS AND OPERATORS throughout the country to act as our agents for the introduction of our superior BURGLAR ALARMS AND ANNUNCIATORS into private houses, hotels, banks, &c. Upon receipt of plans of houses we will send skilful mechanics to estimate upon work, or will give any information in writing that may be required, Liberal commissions will be paid upon any orders that may be secured for us. Our Alarms and Annunciators have just been awarded the FIRST PREMIUM of the American Institute.

Explanatory Circulars will be furnished upon application to the Secretary.

L. G. TILLOTSON,

CORNELIUS ROOSEVELT,

Secretary and Treasurer,

President.

40 West 18th Street, New York.

GEOERGE H. BLISS & CO.,
 41 Third Avenue, Chicago, Ill.
 CINCINNATI, O., ST. LOUIS, MO.,
 Elm St., cor. 5th. 409 North Third St.

Manufacturers and Dealers in
TELEGRAPH INSTRUMENTS AND SUPPLIES,

RELAYS, unequalled for beauty and strength;
 COMBINATION SETS; BOX and POCKET RELAYS.

CHALLENGE, PONY and REPEATING SOUNDERS.

KEYS, various styles, including the SCHNEIDER KEY, just out, no legs, wire connections above the table.

REGISTERS, with SPRINGS or WEIGHT.

OUT OUTS, many varieties, including a new style of PEG CUT OUT, with an adjustable LIGHTNING ARRESTER, just out.

REPEATERS—HASKIN'S AUTOMATIC, and others,

SWITCH BOARDS—REPEATING, BATTERY and GROUND SWITCHES and LIGHTNING ARRESTERS.

ANDER'S GALVANIC and MAGNETO-ELECTRIC PRINTERS; also SELDEN PRINTER.

ELECTRIC BELLS, HOTEL ANUNCIATORS, FIRE and BURGLAR ALARMS, and WATCHMAN DETECTORS.

ELECTRIC RAILWAY SIGNALS and ALARMS, ELECTRIC GAS LIGHTING APPARATUS.

MEDICAL INSTRUMENTS and APPARATUS on hand and made to order. Second hand Instruments for sale cheap, and repairing done at short notice.

BATTERIES in great variety, including the latest inventions; also a full assortment of battery material.

WIRES—MOORE & SON'S and PHILLIPS' MAGNET and OFFICE WIRES, GUTTA PERCHA and KERITE WIRES, BEST GALVANIZED LINE WIRES; SUBMARINE, SUBTERRANEAN and HOUSE CABLES.

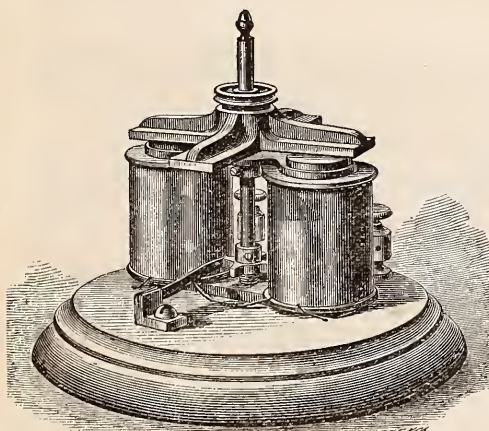
INSULATORS—BROOKS, SCREW GLASS and KENOSHA CARBON. BRACKETS, PINS and SPIKES, TELEGRAPH POLES, LINE BUILDERS and REPAIRERS' TOOLS.

TELEGRAPH STATIONERY—REGISTER, MESSAGE and MANIFOLD PAPERS, CARBON SHEETS, STEEL and AGATE STYLUSES, ORTON'S PENCIL HOLDER, SAFETY MESSAGE HOOK and AWL CLIP, STANDARD TELEGRAPH BOOKS, &c.

PRICE LISTS FURNISHED FREE ON APPLICATION.

Our TELEGRAPH INSTRUMENTS and ELECTRICAL APPARATUS are elegantly finished and mounted on highly polished rosewood, mahogany and walnut bases.

SOMETHING NEW!



[PATENTED SEPT. 29, 1874.]

THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine

Run by Electricity!

It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery.....\$6 00
 " without Battery..... 4 00

May be seen working at the office of the THE TELEGRAPHER.

For sale by

The Electro-Magnetic Manufacturing Company,

36 BROAD STREET, NEW YORK.

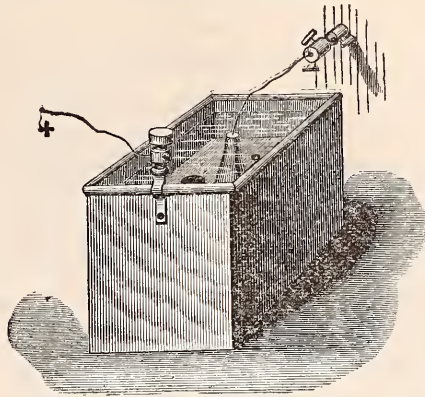
P. O. Box 1804.

Also for sale by

L. G. TILLOTSON & CO., 8 Dey street.

F. L. POPE & CO., 38 Vesey street.

A NEW GALVANIC BATTERY.



Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

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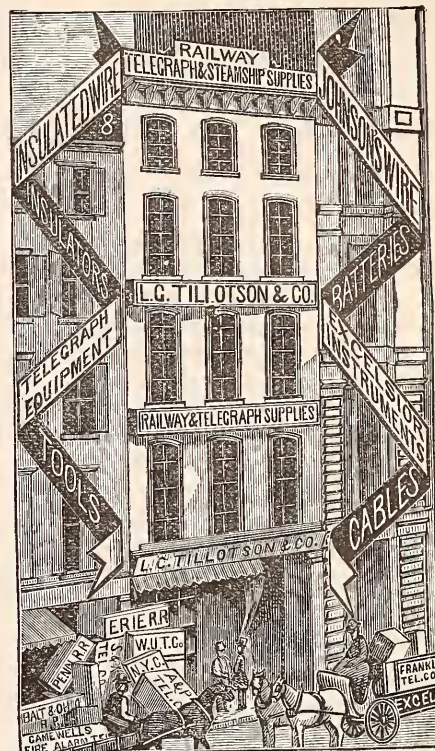
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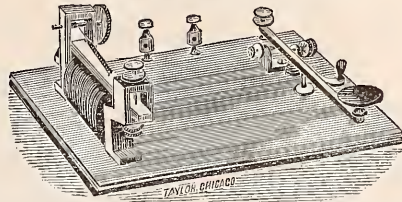
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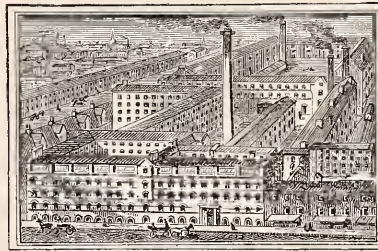
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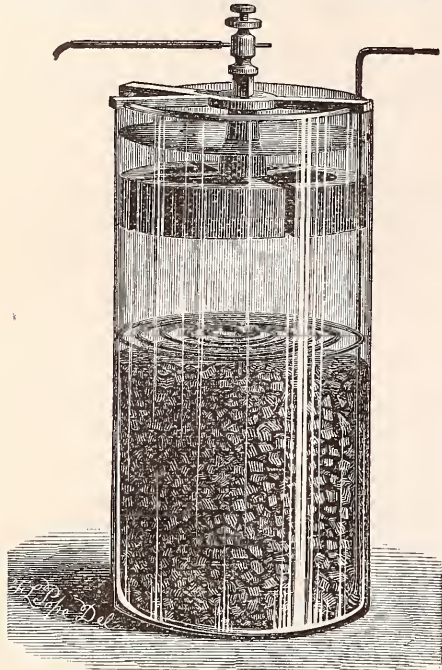
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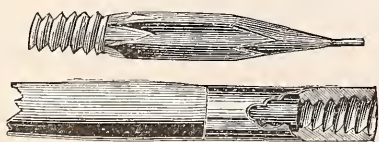
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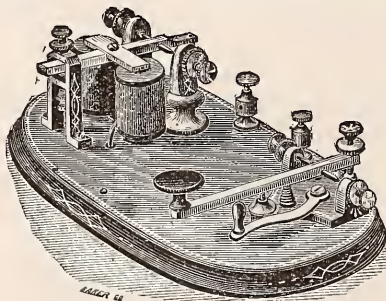
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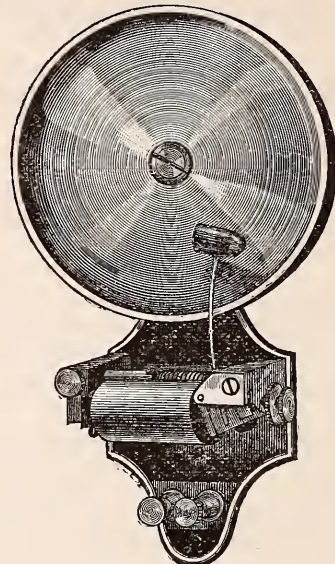
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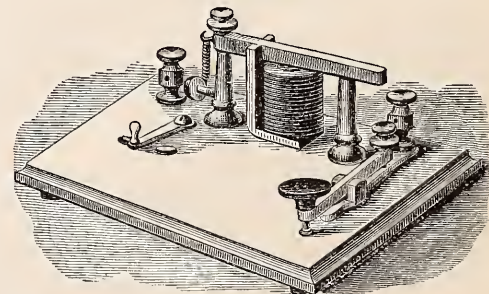
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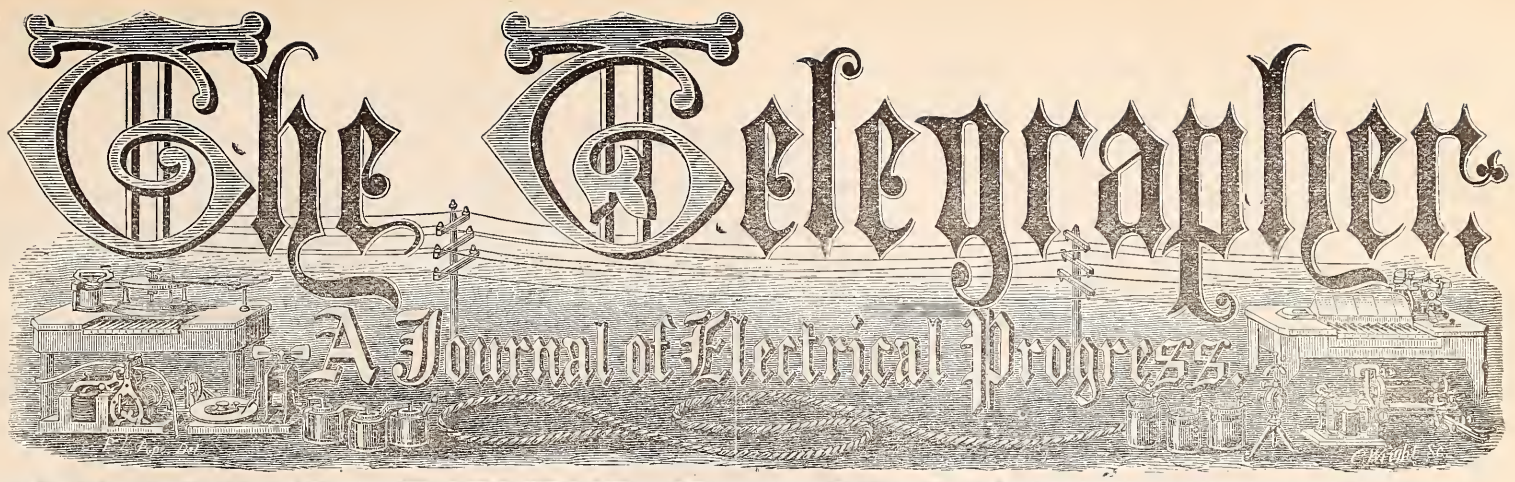
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The Telegrapher

A Journal of Electrical Progress.



Vol. X. New York, Saturday, December 19, 1874. Whole No. 440

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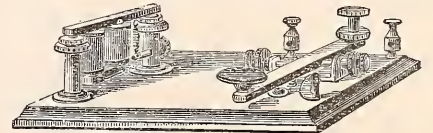
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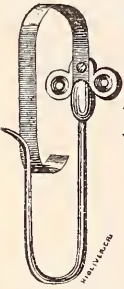
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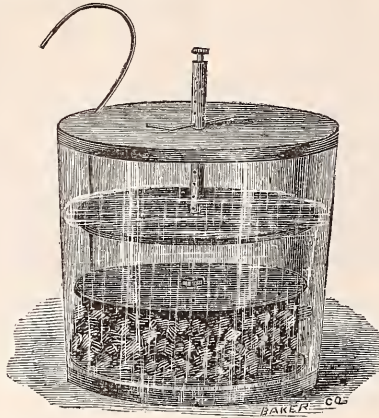
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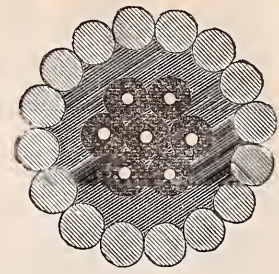
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THE TELEGRAPHER

A JOURNAL OF
ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, DECEMBER 19, 1874.

VOL. X. WHOLE No. 440.

Original Article.

How an Electrician got a first class Lightning Rod cheap.

ANY of our readers who may have happened to be going to or from Hudson Bay, by way of Kichago and Wilmaukee, have doubtless noticed the pretty little village of Lowood, which, attracts the traveller's notice at once, on account of the almost entire absence of lightning rods upon its buildings, so different from other western villages, where the superfluity of these ornamental, if not useful appendages, often makes the locality look, as Mark Twain says, "like a silver-mounted canchake." He will naturally wonder why "this is thus." Thereby hangs a tale. We would not have it for one moment supposed that this state of affairs in Lowood had escaped the eagle eye of the peripatetic vender of paratonnerres—*Anglice*, lightning rods—as he roamed through the villages between Kichago and Wilmaukee, seeking whom he might defraud. Not a bit of it! Lots of these fellows had tried to swindle the Lowoodites with all sorts of patented and unpatented spiral, right and left hand twisted, corrugated, compound and hollow lightning rods; and even the ingenious chap that carried with him an awful example, in the shape of a small model of a dwelling house, inside of which was a bottle of hydrogen gas, that he used to touch off by a spark down the chimney from an electrophorus, the result of which was an explosion that blew the house into smithereens, and hurled its cork inhabitants high in the air, to the mingled delight and terror of the honest granger and his innocent family. Even this worthy practical philosopher couldn't sell rods in Lowood. They would get off from the train with a sample rod about a yard long, mounted on a highly polished mahogany board, proceed briskly up the street, and shortly tackle some *habitan* and commence to expatiate volubly on the dangerous character of the electric fluid, and then pull out statistical tables showing that more property and lives had been destroyed in this way than by the combined effects of war, pestilence and famine. As soon as the *habitan* could get a word in edgewise he would say: "Hold on a minit, Mister; did you notice that handsome cottage near the station, situated in a grove of trees, and surrounded by a big yard with a nice fence around it?" The lightning rod man had noticed it, and intended to call on the owner on his way back and sell him some rods. He thought it the most likely thing in the world that the owner of such a nice looking house might give him an order for rodding it in a most complete and elegant manner. "Wal, he might give you an order, and then agin he might not. No, Mister! In that house lives one of the prominentest citizens of this town. His name is Winters, and he is the boss electrician of the Great Eastern Disunion Telegraph Company, which owns and occupies more litenin' than any concern on airth; and Winters, you just bet he understands the nater of that critter to a fraction, and he says that the rods most of you fellows put up are a dog-goned humbug, and he won't have 'em on his house anyway. You see, we all foller Winters' example, because we know Winters, and Winters is sound; he understands litenin' like a book, and 'tain't no use, Mister, for you to try to sell litenin' rods in Lowood." Then the agent would, after hearing the same story a dozen times, leave town by the first train, a sadder and a wiser man.

Finally, the rod peddlers made a combined assault on Winters. They waylaid him in his office, at the Great Eastern Disunion Telegraph headquarters, on the street corners of Kichago, on the trains of the Northwest-by-nor Railroad as he was going home, and when he approached his house at Lowood, coming from the train, he usually found three or four of these chaps, with "samples," sitting on his verandah and doorsteps. They would beg and implore him to let them rod his house; they would do it at cost, they would do it for nothing, they would even pay him handsomely for the privilege of doing it! Flesh and blood couldn't stand a siege of this kind forever, and Winters finally surrendered, but with all the honors of war. He at last told one agent that he might rod his house if he would agree to do it gratis, and would in all respects strictly follow his directions in putting up and con-

necting the conductors. The agent, in great glee, consented to all the conditions in advance. "Now," said Winters, "I want you to put up a half inch copper rod, and solder every splice in it. Don't you put any of your trumpery insulators on it, but fasten it directly to the house, and rivet and solder it to a plate of sheet copper, ten feet square, and buried horizontally twelve feet under ground." By the time the electrician had concluded his specifications the agent's face was nearly as long as one of his own rods. He silently bowed and departed, and it was so long before Winters saw him again that he concluded he had settled one agent at least. But one evening, as the electrician, returning from Kichago, entered his yard, he discovered a gang of Irishmen at work with picks and shovels, who had nearly completed an excavation in his lawn large enough to bury a horse and cart in, let alone the driver. On a large heap of dirt stood the lightning rod agent, bossing the job of planting the ground plate. And now, to make a long story short, the electrician of the Great Eastern Disunion Telegraph Company is the proprietor of the most scientifically constructed lightning rod, with the fewest "ohms" in it, that can be found in this or any other country. Whether the agent has yet made a colossal fortune putting up similar ones for the Lowoodites, is very doubtful, to say the least.

The Western Union Telegraph Company.—Its Business and Prospects.

THE following is the report made by President Orton to the Directors of the Western Union Telegraph Company, on Wednesday last. The accompanying resolutions declaring a quarterly dividend of two per cent. on the shares of the company, which were unanimously adopted, appeared in the last number of THE TELEGRAPHER.

EXECUTIVE OFFICES,
WESTERN UNION TELEGRAPH COMPANY,
NEW YORK, Dec. 9, 1874.

TO THE DIRECTORS.

The report made to the stockholders at their annual meeting on the 14th of October last contains a full statement of the operation of the company for the fiscal year ended June 30, 1874, and of its condition on that day. Printed copies of this report being now before you, I shall not repeat much of its details in this paper.

At the semi-annual meeting of the directors, held on the 3d day of June last, I submitted a statement in which the profits, partly estimated, for the three months ending June 30 were put down at \$740,000, together with a recommendation from the Executive Committee that a dividend of two per cent. be declared payable out of the profits of that quarter. The actual profits for that quarter, as subsequently ascertained by the official returns, were \$762,029 44.

At a meeting of the Executive Committee held on the 1st day of September last, a dividend of two per cent. for the quarter ending September 30 was declared based upon estimated profits for the quarter of \$825,000. The actual profits were \$822,316 04.

The profits for the current quarter ending December 31st inst., of which we have complete returns for the month of October and nearly complete for November, are estimated by the Auditor at \$856,527 08. After careful revision, I have deducted \$15,000 from the Auditor's estimates, which gives \$841,527 08 as the profits for the quarter.

The following is a comparative statement of receipts, expenses and profits for each month of the year 1874:

	Receipts.	Expenses.	Profits.
January.....	\$48,873 28	\$550,785 52	\$193,117 76
February.....	681,761 11	481,784 15	199,976 96
March.....	761,979 34	504,285 83	257,693 51
April.....	770,961 12	546,758 65	224,202 47
May.....	788,848 96	507,682 07	281,166 89
June.....	798,215 05	536,554 97	261,660 08
July.....	808,979 05	557,744 60	251,234 45
August.....	797,910 91	521,144 51	276,766 40
September.....	839,548 99	545,226 80	294,322 19
October.....	883,678 74	577,151 66	306,527 08
November.....	825,000 00	560,000 00	265,000 00
December.....	835,000 00	565,000 00	270,000 00
Totals.....	\$9,530,749 55	\$6,454,088 76	\$3,076,660 79
December, 1874, estimated.			
1874.....	\$9,530,749 55	\$6,454,088 76	\$3,076,660 79
1873.....	9,282,033 66	7,047,016 38	2,235,017 28
	\$248,715 89	\$592,927 62	\$841,643 51
	(Increase.)	(Reduction.)	(Increase.)

It appears from this exhibit that the gross receipts for the current year are \$9,530,749 55, against \$9,282,033 66 for 1873, showing an increase of \$248,715 89 for the current year, while the expenses have been reduced from \$7,047,016 38 in 1873 to \$6,454,088 76, being a difference of \$592,927 62 in favor of the current year, and that the profits are \$3,076,660 79, against \$2,235,017 28, being an increase of \$841,643 51 over the profits of 1873.

In view of the facts above stated the Executive Committee at their regular meeting on the 2d inst. passed a resolution recommending that the Board at

this meeting direct a dividend of two per cent. to be made out of the profits of the current quarter.

The year 1874 has been notable for the general dullness in every department of business which has prevailed in all sections of the country. The fact that we have been able during the year to increase receipts and reduce the expenses of the company, so as to yield a net profit of nearly forty per cent. in excess of the preceding year, may be accepted as an indication of what the results will be when the business of the country shall have resumed its accustomed activity. The results of our operations this year also seem to confirm the wisdom of the policy which the managers of the company have steadily pursued, for several years past, of extending the lines, increasing the facilities, reducing the rates and so improving the character of the service as to induce the public to increase their use of the telegraph.

On the 1st day of February, 1873, the maximum tariff between the most remote points on the company's lines was fixed at \$2.50. This was equivalent to a reduction of more than fifty per cent. on messages between the Atlantic and Pacific States, the rates having been previously from \$5 to \$7.50. The first effect of this reduction was a considerable loss of revenue. But for several months past the revenue from messages between the Atlantic and Pacific States has been larger than during any corresponding period before the rates were reduced, and we have been able to transmit the increased volume of business with even greater promptness than before, without the addition of a single wire to the transcontinental line. This result is largely due to the successful operation of the duplex apparatus, of which I have spoken in previous reports.

In my last annual report to the stockholders, I stated the fact that we were then operating between New York and Boston, and had been for about two weeks previously, an apparatus called the quadruplex, by means of which two messages were sent in the same direction, and two other messages in the opposite direction upon one wire at the same time. Since that time the inventors, Messrs. Thomas A. Edison and George B. Prescott, have so far perfected the apparatus that it is now working successfully on a direct circuit between New York and Chicago. The great success of this invention within so short a time after its introduction leads me to believe that we shall be able to put it upon routes between all stations where the business requires the use of either two, or three, or four wires. If the further experiments about to be made shall demonstrate the ability of this apparatus to work satisfactorily through the long circuits of the lines to the Pacific, thereby increasing the capacity of those lines, without involving any expense for additional wires, I shall be inclined to recommend a further reduction of the present maximum rate of \$2.50. Indeed, such is my confidence in the growth of the telegraph business within the next few years that I believe it will be practicable for the company to continue reducing the higher rates, and extending the distances to which the lower rates are applied, until we shall ultimately have but four rates for day messages, namely:—25 cents, 50 cents, 75 cents and \$1, and half these rates (excepting the lowest) for night messages, and that this result can be gradually accomplished without impairing the company's ability to pay satisfactory dividends to the stockholders.

Mention was made in my Annual Report of the fact that the cable of the International Ocean Telegraph Company, which connects the coast of Florida with Cuba, was interrupted between Punta Rassa and Key West, and that efforts were then being made to repair the break and restore communication. I now have the pleasure to report that by the aid of the International Ocean Telegraph Company's steamer Professor Morse, Mr. N. De Bree, the agent of the company at Key West, has thoroughly overhauled the cable, cut out several defective parts and brought it into perfect working order. On account of this success, efforts are now being made to recover and restore another cable between those points, which failed and was abandoned three years ago.

Respectfully submitted,

WILLIAM ORTON, President.

Details of the Wreck of the Cable Steamer La Plata.

By mail from England has been received the details of the wreck of the Messrs. Siemens Brothers' cable steamer La Plata, in the Bay of Biscay, which foundered off Ushant on Sunday morning, Nov. 30th, only 15 of those on board having been saved, 60 persons losing their lives by the disaster.

The La Plata was a steamer of 965 tons register, built in Shields in 1862, with engines of 120 horse power. She had done much service in laying telegraph cables, notably those between Holyhead and Kingstown, Villa Real and Gibraltar, Heligoland and the Elbe, Constantinople and Odessa, the Shetland Isles and a section of the Calio and Isle de Franco line. On the

present occasion she was chartered by Messrs. Siemens Brothers from the owner, Mr. W. T. Henley, of Fenchurch street, and carried a crew of captain (Dudden), three officers, surgeon (Hughes), four quartermasters, four engineers, seven stewards, three cooks, two boatswains, a carpenter, eleven stokers, twenty-one seamen and a lamp lighter, besides the professional staff—namely, Mr. Ricketts, in charge of the cable and grappling apparatus; six electricians and ten cable laying hands. There were five boats on board and two patent rafts—one on the bridge and the other on the after deck. The wind up to Friday evening was fair, when it blew—as one man described it—“a living gale,” and the ship became almost unmanageable. This was partly owing, some of the survivors declared, to the character of the machinery on board. The vessel shipped vast quantities of water, and the ponderous grappling apparatus, several tons in weight, was said to have shifted, splitting the decks and letting in the water.

The La Plata foundered off Ushant, in the full fury of the southwesterly gale, or rather hurricane, which, from the time of its outbreak, had veered round from the north. The quantity of telegraph cable which had been paid out, with the vain endeavor, by lightening the ship, to counteract the effects of the seas that broke in upon her, was 150 miles of the 250 she had in her hold.

Subjoined is the report of Mr. Walker, late chief steward of the La Plata: “La Plata, Captain Dudden, left Gravesend on the morning of Thursday, 26th November, in charge of Mr. Martin, pilot, bound for Rio Grande Sol. We arrived off the Isle of Wight on Friday morning, when the pilot left. The ship then proceeded down the Channel, and toward evening the wind began to freshen, the ship steaming about four knots—the wind still kept increasing, till on Saturday at midnight it was blowing a gale. We shipped a heavy sea, which carried away the port jollyboat and davits, one man being at the same time washed overboard. A short time afterward the starboard waist boat was carried away. The gale still increased. On Sunday morning, between eight and nine, the engineer reported the ship making a great quantity of water. It was then agreed to lighten her, and we commenced paying out the cable over the boom. We paid out a quantity and then let it go. By ten o'clock the fires were all out in the stoke hole. We then prepared the remaining boats and rafts to leave the ship, which was gradually sinking by the stern. At half past twelve she foundered, stern first, with sixty persons on board. The only persons who got off were twelve in the port quarter boat, and three others were picked up, making fifteen in all. Before leaving we saw one boat on the port side stove in. Of the remaining two boats, one was capsized when the ship went down and the three persons picked up were out of her. The captain and doctor remained on the bridge, having failed to get clear the patent life rafts, and both are supposed to have sunk with the remainder of the crew when the decks blew up. We were in the boat two hours before clearing away from the wreck, being unable to render any assistance through fear of staving and swamping the boat. We were in the boat for twenty-three hours, provisioned with only a small piece of cheese and one bottle of gin. We kept two hands bailing with buckets the whole time, as our boat made much water. At daylight on Monday morning we saw a ship, distant about five miles off, which proved to be the Gare Loch, of Glasgow, Captain Greenwood, by whom we were picked up about half past eleven, and were treated most humanely by the captain, his lady, the surgeon, officers and passengers, all of us being supplied with stimulants, and dry, warm clothing. After an hour on board we were transhipped to the steamer Antenor, for London, and landed at Gravesend. The survivors beg publicly to return their most sincere thanks to the commander and all on board the Gare Loch.”

Of those on board at the time the La Plata foundered there were lost, Captain Dudden, Mr. Hughes (the surgeon), the three officers, one of the four engineers, seven of the ten stewards and cooks, both the boatswains, the carpenter, all the eleven stokers, fourteen of the twenty-one seamen, and the whole of the cable staff numbering sixteen, with Mr. Ricketts and the six electricians accompanying him.

A Scientific Practical Joke.

In a little work entitled “Recuerdos de Humboldt” (Recollections of Humboldt), the author, Dr. Aristides Rogas, relates what he terms *un incidente gracioso*, which happened to Humboldt at Calabozo. On approaching Llanos he was very anxious to obtain information about the electrical eels (*tembladores*) which abound in the rivers of the district. For this purpose he arranged to visit an eccentric student of electrical science, who, before the appointed time, contrived—with some ingenuity and great difficulty—to place one of the fish in question *en rapport* with the knocker on his study door. The servant, as desired by

his master, directed the illustrious visitor to rap, and on his doing so a discharge of electricity took place, throwing him to the ground.

The narrative goes on to state that Humboldt received his practical information as to the nature and amount of the electricity generated by the *tembladores* with all the equanimity of a philosopher in search of knowledge.

The Telegraphers' Mutual Benefit Association.

ACKNOWLEDGMENT OF RECEIPTS FOR ASSESSMENTS UP TO AND INCLUDING DEC. 10, 1874.

ASSESSMENT No. 71.

4, 5, 16, 21, 25, 28, 46, 53, 56, 74, 77, 86, 91, 98, 112, 121, 131, 145, 157, 181, 188, 208, 211, 217, 235, 245, 267, 274, 277, 286, 289, 301, 302, 349, 383, 385, 416, 434, 464, 467, 510, 526, 532, 536, 547, 549, 553, 564, 576, 594, 615, 622, 626, 649, 703, 715, 721, 731, 815, 821, 825, 832, 858, 880, 915, 916, 923, 941, 1001, 1013, 1024, 1039, 1054, 1081, 1084, 1126, 1154, 1173, 1175, 1178, 1182, 1183, 1199, 1225, 1252, 1259, 1282, 1293, 1300, 1304, 1306, 1345, 1357, 1368, 1371, 1394, 1402, 1403, 1404, 1409, 1410, 1440, 1518, 1527, 1550, 1568, 1571, 1690, 1695, 1708, 1735, 1815, 1831, 1852, 1862, 1894, 1901, 1944, 1950, 1951, 1985, 2019, 2027, 2030, 2036, 2049, 2082, 2135, 2143, 2164, 2174, 2175, 2178, 2214, 2228, 2229, 2238, 2239, 2241, 2259, 2287, 2289, 2305, 2308, 2311, 2312, 2322, 2330, 2334, 2336, 2337, 2338, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359.

ASSESSMENT No. 70.

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ASSESSMENT No. 69.

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ASSESSMENT No. 68.

185, 186, 187, 496, 497, 499, 500, 505, 507, 508, 695, 697, 705, 1071, 1104, 1400, 1504, 1556, 1557, 1570, 1613, 1670, 1741, 1921, 1945, 1946, 1987, 2151, 2236.

MISCELLANEOUS.

No. 67.—2115.
No. 66.—490, 506, 800, 1496.
No. 65.—495, 503, 2132, 2251.

Members of the Association who look to THE TELEGRAPHER for receipt of assessments paid, will please take notice, that an acknowledgment of the receipt of one assessment should be taken as a receipt for all previous assessments.

Character of Electric Discharges.

A FLASH of the duration of $\frac{1}{1000000}$ of a second is instantly recognized by the retina, but the effect on the eye lasts fully $\frac{1}{2}$ of a second. The duration of the flashes recently examined by Professor A. M. Mayer, of the Stevens Institute, varied from 0.124 to 0.0416 of a second. An idea of the length of this last mentioned interval may be obtained by recalling the fact that a rapid involuntary wink takes place in nearly the same time. That the Leyden jar discharge is multiple was discovered by Professor Henry, and this has been subsequently confirmed by Cazin, Tedderson and Rood. Professor Mayer, however, has sought more definite results, and the object of his investigations has been a permanent record of the character of the discharge, of its duration, and of the intervals separating its constituent flashes and sparks. To this end he prepared disks of thin printing paper, blackened over burning camphor, and of a diameter of 5.8 inches. When one of these was revolved very rapidly it became quite flat by centrifugal action, and in this position the discharge between points or balls perforated it, leaving the required record. By presenting momentarily to the rotating disk the delicate point attached to a vibrating tuning fork, the number of vibrations per second of the fork was determined to the last degree of precision by means of a break-circuit clock, which at each second sent a spark from an inductorium through the fork. The result was traces on the blackened disk; and by tracing the axis of the sinusoidal line with a

needle point, and then drawing radii through symmetrical intersections of the axis on the line, the disk was divided off into known fractions of time. These marks were then rendered permanent, the disk centred on a dividing circle, and the indications read by a low power microscope, determining with accuracy intervals and durations to one 50,000th of a second.

The results thus far obtained we summarize below, and we understand that others have been reached which the investigator withholds until he has subjected them to more careful examination.

The first discharge was between large inductorium points, 0.39 inches apart, the striking distance of the coil being 17.7 inches. Thirty-three clear round holes were made in the disk by a portion of the discharge lasting $\frac{1}{3}$ of a second. The average intervals between the perforations at the beginning was $\frac{7}{100}$ of a second; then followed a period of quiescence of $\frac{1}{1000}$ of a second, and then a shower of 30 minute sparks, lasting $\frac{1}{30}$ of a second. The average interval separating these was $\frac{1}{1000}$ of a second. The second discharge was between platinum points, 0.39 inches apart, of a large inductorium, with a Leyden jar of square inches, connected with the terminals of the secondary coil. The discharge on its path around the disk dissipated 91 little circles of carbon, each perforated by from 1 to 4 holes. The discharge lasted 0.124 second, and the intervals were $\frac{1}{100}$ of a second up to the tenth flash. For four fifths of the discharge they were separated by $\frac{1}{1000}$ of a second, and at the last by $\frac{1}{1000}$ of a second.

We understand that Professor Mayer is examining the discharges of the frictional and Holtz machines, as well as of the Leyden jar and inductorium, so that results of considerable scientific interest and importance may be expected.—*Scientific American.*

Electrical Countries.

CERTAIN interesting phenomena have recently been noticed by the Hayden Expedition in the mountains of Colorado, showing the high electrical state of the elevated position known as Station 9, Uncompahgre Peak, during the passage of a storm. Although the indications of a change in the weather could be seen at a distance, the electricity at the point of observation did not become plentiful until a characteristic buzzing was heard. Painful sensations followed, and at the back of the head and at the elbows a sharp pricking, like that of needles or a sharp knife, was felt. By this time the party came to the conclusion that they were standing on dangerous ground. Those standing on the very summit of the peak and along the sharp ridges leading from it experienced the severest shocks. After beating a hasty retreat, and remaining on the sides of the mountain to continue observations, it was noticed that after each discharge or flash of lightning, a short rest ensued, until a sufficient quantity of electricity had again accumulated. Those nearest the point struck would feel a heavy shock pass through them. These same phenomena were noticed during three days of continuous storms. At many places the rocks were glazed where the electric current had passed. The formation of tubes in sand from the same cause is well known.

A French meteorologist, M. Fournet, has suggested that it would be an interesting question for Science to determine whether certain countries or regions are in a higher electrical condition than others, and whether meteorological reactions do not result from the unequal distribution of the electricity. Similar phenomena to those detailed above have been noted upon the elevated plateaus of Mexico, and nearly a century ago Volney recorded remarkable noises occurring during thunderstorms in the neighborhood of Philadelphia. In South America, at Popayan, province of Granada, Boussingault says that thunder is heard every day and electrical phenomena are common. The extreme dryness of the Andine table lands also favors similar effects, and it is said that in the Chilian desert involuntary erection of the hair upon animals, as well as the appearance of sparks leaping from clouds to soil, is common. Dr. Livingstone notes that during the spring, a period of great dryness, the African deserts are traversed by a warm north wind so highly charged with electricity that the plumes of the ostrich stand upright, and that sparks are produced by the mere attrition of the garments.

In India, at certain localities, telegraphic wires are maintained with great trouble. It is stated that during storms of exceeding violence the conductors become charged almost to melting. Professor Loomis has observed abundant electricity in the atmosphere about New York city, especially during winter. We have repeatedly remarked the high electrical condition of the hair on cold nights, and also that the mere act of walking on a soft carpet in a heated room will cause a crackling sound under the foot.

From all the various examples which have been collected of this curious condition, it would appear that the abundant presence of electricity is not due necessarily to heat of the season, since in this country it is never more strongly manifested than after a cold

northwest wind; nor are indications in any other region more clear than in the dry and icy air of Siberia. It would appear that the reservoirs of electricity exist in the most widely separated parts of the globe. If it be admitted, in accordance with the opinions of Fournet, Manry and Admiral Fitzroy, that the ordinary winds are in relation with these great electrical sources, further and more extended operations upon them would be in the interest of meteorological progress. If, for example, the electricity of each great atmospheric current, tropical or polar, is regularly positive or negative, it may be, as Fitzroy suggests, believed that the changes of weather which supervene, at the moment when one electrical current succeeds the other, have on a small scale a certain analogy to the changing of the trade winds. Fournet remarks upon a natural relation of these phenomena with the meteorites produced during storms. These views are, however, mainly conjectural, so that there remains a large field for definite research.—*Scientific American.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

The Other Side.

TO THE EDITOR OF THE TELEGRAPHER.

THE TELEGRAPHER for some time past, and especially of late, has endorsed the automatic system as being the best and most practicable method of realizing cheap rates for telegraphic service. In a recent editorial there appears a statement that the system is "not inimitable" to the skilled labor of the Morse system. Several of my friends, as well as myself, cannot so understand it, but are open to reasonable conviction.

Let us look at the question a little in detail. We will suppose that the Automatic system will transmit as many words over a wire as the managers of the scheme claim, thus setting aside the question of its scientific success, although crosses, etc., might practically reduce the average speed. The Labor question is the question interesting us the most.

The work of preparing a strip for the Automatic transmitter requires a certain amount of time, afterwards further time for transmission, and still other time for copying after its reception. Touching this consideration of time, we find the Morse operators performing instantaneously the work of transmitting and copying, thereby saving over one half in time, as the message would be copied ready for delivery by Morse in the time occupied in simply preparing the slip for the Automatic. To counterbalance this, the Automatic system must more than double the number of employes of the Morse system in order to accomplish the same work in a given time, as every practical operator is aware that more words can be copied from an instrument in a specified period of time (all things being equal) than can be translated from strips and written out.

Should skilled labor be employed by the Automatic system with as high rates of compensation as are now paid to Morse operators, the cost of service to any company adopting it would be more than doubled, making, I am afraid, an expense actually exceeding the amount saved in interest on money invested in more wires—even were they only duplexed.

The Automatic Company now in operation between New York and Washington claims to pay its employes in New York city an average of but forty dollars per month. (See their report of trial on President's message a year or two ago.) Now, anybody knows that neither skilled nor reliable labor can be employed at any such average rate. We know, of course, that a certain amount of skilled labor is requisite in any system; perhaps in this case it would be comprised in the manager and chief operators of the offices. Is it likely that a company will pay from eighty to one hundred dollars per month in New York city for men to copy from slips, if they can hire boys at forty or fifty? Again, if it is possible to work a Quadruplex successfully, utilizing one wire so as to do the business of four average single wires, there would be wires enough in the country to do the business likely to be offered for many years to come. The Quadruplex has been worked up to the standard of four wires on test occasions. Although it is not claimed to be perfected yet, it is being worked from New York to Chicago satisfactorily.

For the reason that labor can remain as it is now employed and compensated with the success of the Quadruplex, and must change with the Automatic, and again, from the belief that one wire utilized up to the value of four single wires will be amply sufficient for all the business of the country, even at cheaper rates, arises the antagonism among the profession to the Automatic and the preference for the Quadruplex. Much has been said about the breaking upon the

Duplex and Quadruplex interfering with their speed; but those, while true if they existed, are not practically substantiated in actual experience; men are placed upon Duplex and Quadruplex wires who think it no great feat to receive for a whole hour without opening their keys. A break upon the Quadruplex affects but one man besides the breaker himself; the other two working on, unconscious of it.

As it was found infinitely more reliable to do Morse business by sound instead of paper in former years, so I imagine, upon the same grounds, that a Quadruplex would be much more correct on the whole than the Automatic. In that system the subject matter passes through the hands of two different persons (the puncher and the copyist) at totally different times, consequently neither can serve as a check upon the other, while in the Morse system exactly the opposite is true in practice, many mistakes being thus detected.

The gist of the matter appears to rest just here. Should the Automatic system employ skilled labor, and pay accordingly, they must incur an expense likely to be double that paid for the same work by Morse in a like time. Cheapening rates, and thereby gaining more business, would proportionately increase this expense; thus, while saving the number of wires, the company would deplete their treasury.

Cheap labor appears to be the only way that the Automatic system can succeed financially, as it is a well known fact that at present no inconsiderable amount of the receipts of telegraph companies are paid to employes. To double, or even materially increase this expense, would be disastrous.

Unless we see something in THE TELEGRAPHER that will convince us that our opinions are erroneous, it will almost appear that, for the first time, THE TELEGRAPHER has a policy not in consonance with the interest of the vast majority of telegraphers.

Knowing that your columns are open to any fair minded and honorable expression of opinion, I proffer this communication, hoping thereby to elicit a more detailed expression of your own views as to the merits of the rival systems—the Automatic and the Quadruplex. MORSEITE.

Successful Working of the Quadruplex.—Good Time on President's Message.—Reduction of Salaries, etc.

CHICAGO, Dec. 14th.

TO THE EDITOR OF THE TELEGRAPHER.

ANOTHER successful trial of the Quadruplex was made on the morning of the 7th in the Western Union office here, and I understand they have been working it more or less every day since, as duplex, triplex or quadruplex, as the business demanded, using it on their large No. 6 wire through repeater at Buffalo to New York.

Very good time was made on the President's Message, both on the Atlantic and Pacific and Western Union lines. I was unable to get figures from the A. and P. as telegraphers in other business can't get as much information from them as from the W. U. The W. U., I understand, had it repeated at Buffalo, receiving it on 4 wires from there, and distributing to papers and sending on the same number of wires to Milwaukee, in two and one half hours. Assistant night manager Springer, and Messrs. Whitford, Mereness, Stone, and Billy Wallace did the receiving, while Jim Fiske F. E. Angell distributed the Chicago press copies to the satisfaction of all concerned, and Messrs. Anderson, Hazeltine, Fortier, and A. J. Long rushed it to Milwaukee. Very good time was also made in getting it to San Francisco; counting out the difference in time between Chicago and San Francisco, they had the message there in fifteen minutes after it was received in Chicago.

The A. and P. has very unwisely, in our estimation, reduced these salaries of all their operators here, who were getting over eighty-five dollars a month, to one thousand dollars per year, and those who had been getting salaries below that figure as much in proportion. The result of this will be to drive all the better class of operators out of their employ, as fast as they can get suitable places elsewhere with other companies.

Mr. O. M. Stone, day report operator of the W. U. office in this city, has received the appointment of Chief Operator and Secretary to the Master of Transportation of the Western Division of the Baltimore and Ohio R. R., with headquarters in this city. This is an excellent appointment, and the B. and O. R. R. will never have cause to regret it.

Telegraphing is rather dull and probably will be until after the holidays. OCCASIONAL.

A New Plug Factory Started.—A Bull.—Probable Reduction of Salaries.

TO THE EDITOR OF THE TELEGRAPHER.

In the language of the darkie preacher at camp meetings, "still dey enm." A majority of the fraternity had lost track of A. M. Valentine, formerly manager

of the "Mx." Chicago Western Union office, and his brother, formerly manager of the Northwestern Telegraph office at Janesville, Wis. "Gone into other biz," was the answer given to all anxious inquirers when interrogated as to their whereabouts, their immediate friends no doubt being ashamed to tell what that "other business" was. Well, to make a long story short, there has been another "plug" factory established, and it is at Janesville, Wis.

Could first class intelligent telegraphers engage in a more disgusting business? If they could I would like to have you or your readers point it out to me. The aforesaid Messrs. Valentine are the proprietors. I would rather a friend of mine would engage as boot black to a fifth class ten cent barber shop, drive an omnibus, make soap, chew gum, preach, go to Congress, anything under the light of the sun than start a Telegraph College. It's a shame that the authorities don't abate them as nuisances. There never has yet a College student graduated and been able to take a situation in an office in any capacity from messenger upwards. Why don't some of the older telegraphers get some of the leading St. Paul, Milwaukee, or Chicago dailies after those miserable frands.

Judging from a conversation in regard to this Janesville affair over one of the Northwestern lines a few days since, between two well known managers out this way, this one is but a sample of the many that are in full blast all over the country.

Quite an amusing bull was made by one of the gentler sex recently in this neck o' woods. "Ten coal stoves" being received and delivered by her "Ten coat sleeves." She must have been thinking more of coat sleeves than coal stoves. Probably she has been kept as warm by the former many times as by the latter—who knows.

This is the time for cutting down salaries in this section. The policy will no doubt be inaugurated soon. More anon. NORTHWEST.

Legal Proceedings against the Automatic Telegraph Company and others.

A SUIT has been commenced by Messrs. Daniel H. Craig and James B. Brown, plaintiffs, against Messrs. Geo. H. Harrington, Geo. Little, Thomas A. Edison, The Automatic Telegraph Company and the National Telegraph Company, defendants, in the Superior Court of the City of New York, in which the plaintiffs claim a judgment for an account from the Automatic Telegraph Company of the receipts of the company, and for payment of the royalty reserved to the said D. H. Craig under a contract dated September 9th, 1869. Also, a decree enjoining said Little, Harrington and Edison from selling or disposing of in any way, without the consent of the plaintiffs and the Automatic Telegraph Company, of the rights, title or interest in the inventions and patents of said Little and Edison in connection with the Automatic or Fast Telegraphy. Also, for a decree enjoining the Automatic Telegraph Company and the National Telegraph Company from making any sale, assignment or transfer of said patent rights granted to the National Telegraph Company by said contract of September 9th, 1869.

The plaintiffs also ask for a preliminary injunction on the defendants, as above, pending the decision of the suit.

Government Telegraph Schemes.

NOTWITHSTANDING that the new Postmaster General has set his face resolutely against the combination of any telegraphic schemes with his department, a bill has been introduced in Congress to have a postal line established between Boston and Washington. The scheme was brought out by a Southern Senator, evidently to feel the pulse of the North on the subsidy and improvement business. These gentlemen may as well understand at once that people in this part of the country are opposed to any such schemes. Whenever the Government has gone into private business, such as the construction of railroads, it has made a muddle of it. From the tone of the President's message, it is evident that he wishes to confine his administration to its legitimate channels. When Congress attempts to go a step beyond that limit it will do it in opposition to the popular will.—*New York Commercial Advertiser.*

EXPERIENCE has shown that the great difficulty to be surmounted by those who desire to acquire knowledge, is the wish which they possess to proceed rapidly. Progress, to be real, must be slow and cautious. —*W. H. Precece.*

BREAK! break! break!
On that darned old shanty key,
A hundredth part of the patience I have
He never has shown to me.

Break! break! break!
Did you ever see such a plug?
If I had him here I'd certainly punch,
His horribly ugly mug!

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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DEVOTED TO THE INTERESTS
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Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

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THE TELEGRAPHER,

which will commence with the number for JANUARY 2, 1875, desires to return thanks for the LIBERAL SUPPORT which it has hitherto received, which it is expected and believed will be continued during the ensuing year.

All the popular and valuable features of the paper will be retained, and it will continue as heretofore to labor for the best interests of the TELEGRAPHIC FRATERNITY and the advancement of ELECTRICAL SCIENCE and the TELEGRAPHIC ART.

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is a thoroughly INDEPENDENT TELEGRAPHIC NEWSPAPER, bound to in the interests of no TELEGRAPH COMPANY, CLIQUE or COMBINATION, but honestly devoted to the interests of the PRACTICAL TELEGRAPHERS.

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J. N. ASHLEY, Publisher,

(P. O. Box 5503,) NEW YORK.

The Telegrapher and Automatic Telegraphy.

We print this week a communication from a telegraph operator on "The other side" of the subject of automatic telegraphy, its relative cost, its bearing upon the interests of the telegraphic fraternity, and the proper position of THE TELEGRAPHER in its consideration and treatment, as the representative of the interests of the telegraphers of the country.

We are pleased to publish this communication, notwithstanding its criticisms of the paper. Our columns are freely open to the discussion of all matters of telegraphic interest, and if in our editorial treatment of such subjects we are in error, we are willing to be convinced, and acknowledge our error. The communication of our correspondent "Morsetite" is well and temperately written, and forcibly presents his views, and we doubt not that of many other telegraphers.

It may be conceded that the preparation of the messages for transmission by the automatic instruments and for delivery after transmission occupies time, and that in this instance time is money. The question really is, so far as telegraph companies are concerned, whether the aggregate cost of the service is as much or more than it would be under other systems of telegraphy. If it is, then that objection would be fatal to it. We do not believe that this has been or can be demonstrated. The process of preparing the messages for automatic transmission can be accomplished by the punching machines now in use more rapidly than the average time of transmission by the ordinary systems. It certainly requires practice and skill on the part of those engaged in this part of the business to do it rapidly, but so does it require these to transmit rapidly by any other system. When thus prepared, the message can be transmitted automatically with a rapidity and certainty that is not attainable by any other telegraphic process. The labor of a number of punchers would be requisite to keep a single wire employed automatically, worked at the minimum of its speed. It renders possible the utilization of a wire to its full capacity, which is not possible under any other system. In case of the interruption of a wire from crosses or breakages, the accumulation of business for an hour can be worked off in a short time, and the entire time during which such interruption continues can be utilized for the preparation of the messages for such rapid transmission when the difficulty is remedied. By other systems such accumulation of business has to be worked off at comparatively a slow rate, and frequently hours must elapse before the files are cleared.

The business automatically transmitted can be copied and prepared for delivery by any number of persons required, and there is, consequently, no unnecessary delay in doing it. If the amount of business to be done were limited to that which is now transmitted, it might, perhaps, cost nearly as much to do it, excepting, of course, what is saved by the smaller number of wires as at present; but by the automatic system the whole time of the persons employed can be utilized, and nothing would be lost waiting for circuits etc., which every practical telegrapher knows, on Morse lines, interferes so seriously with the amount of work which an operator can accomplish. The saving of time thus effected, in a large office especially, is a very important factor in the problem of expense, and renders it practicable with the same number of employés to execute a much larger amount of business, at a relative less expense to the company.

It is, however, with its bearing upon the interests of the telegraphers themselves that our correspondent and telegraphic readers generally are most concerned. It is argued that under the automatic system skilled telegraphic labor will be at a discount; and, as we have before remarked, some of the promoters and advocates of the automatic system are responsible for this impression. In making out their claims of the system to public favor, they have placed the compensation of the employés at exceedingly small figures—much lower, in fact, than persons suitable for the work could be employed for in ordinary times. Our corres-

pondent refers, in this connection, to the report of Mr. HARRINGTON of the trial on the transmission of the President's message between Washington and New York last year, which, he says, states the average wages of its employés to be forty dollars per month. If he will refer to that report he will find the salaries of the operators engaged in that work to have been put down at \$100 per month. The salaries of the punchers and copyists are put at forty dollars per month—which is, undoubtedly, lower than suitable persons could be obtained for in ordinary times, and if the system were generally introduced and a considerable number of them were required. As before stated, it requires practice and skill to become expert and rapid in the preparation of the matter for transmission, and the enormous increase of business which would follow the general introduction of the automatic system would create a demand for such skill and experience that would insure its proper and adequate compensation. It would also necessitate the employment of more operators than would seem necessary with the business as it now is.

From a personal examination of the matter we are convinced that it requires as much intelligence and skill to make a first class "puncher" as it does for a good operator, and automatic telegraph companies would find it necessary to pay as good salaries as are paid for such skill and intelligence in operating. Does our correspondent doubt that the Western Union or any other telegraph company would soon fill its offices with \$40 operators if they could do so with safety to their business and profit to themselves? Besides, we have never claimed or believed that the automatic system was to entirely supersede all other systems, but have always believed and held that, while it would be most advantageous on main routes and between the principal offices, it would necessarily be worked in conjunction with the other systems of telegraphy. The increase in the business, and the necessity for employing operators to work circuits by other systems in connection with the automatic, would undoubtedly give employment to as many operators as at present, and at as satisfactory remuneration as now.

Our correspondent seems to think that we are not inclined to give the quadruplex arrangement the credit which it deserves. In this he is mistaken. We have never asserted or argued against the quadruplex that it was not feasible or practicable. We have asserted, what every intelligent electrician well knows, that quadruplex telegraphy is not a new invention *per se*, and that its practicability is mainly owing to the application to it of Mr. STEARNS' condenser. THE TELEGRAPHER has not been backward in according to Mr. STEARNS the credit due him for making the duplex practicable, and to his application of the condenser probably more than to anything else is due the success of the quadruplex.

We have also believed, on scientific principles, that it would not be found practicable to work the quadruplex successfully on ordinary wires, but that it would require conductors either of a large size or with very perfect insulation, and as we understand, the experience of the Western Union Co., thus far, has proved the correctness of our opinion.

We are watching with interest the experiments which are being made with the quadruplex, and willingly record its successes in THE TELEGRAPHER. If, as Mr. ORTON states in his report, which we print this week, it solves the problem of cheap yet remunerative rates for telegraphic service, we shall not be slow to recognize its value, whatever we may think personally of the individual who claims the credit of having successfully adapted it.

In some remarks which we printed some weeks since on the "Organ Business," we referred somewhat harshly in this connexion to Mr. GEO. B. PRESCOTT, the electrician of the Western Union Company, who seemed to be associated in what we considered an attempt to manufacture capital by excessive premature laudations of the invention and presumptive inventor, and in the design to injure THE TELEGRAPHER, by bolstering up a

nonsensical sheet in opposition to it. We have been assured that we were wrong in our premises, and regret that any injustice was done Mr. PRESCOTT, with whom our personal relations have always been and continue to be friendly.

In conclusion, we would say that we should very much regret to believe that THE TELEGRAPHER had a policy not in "consonance with the interests of the vast majority of the operators." While we do not believe that any telegraphic system can be permanently shelved because it will reduce the compensative cost of telegraphic labor, whether THE TELEGRAPHER shall recognize and advocate it or not, we are equally confident that the general introduction of the automatic system, for the reasons before stated, will not be inimical to the interests of the telegraphic employés. Having no pecuniary interest in any telegraph company or system, we are in a position to maintain the independence of THE TELEGRAPHER, and shall endeavor, in all scientific and practical telegraphic matters, to deal fairly and equitably. The real interests of the telegraphers are our interests as well, and certainly it is not intended that any policy which we may adopt shall be otherwise than favorable thereto.

A Reform Needed in our Patent Laws.

It is generally conceded by political economists that a well devised and properly administered system of patent laws is of the utmost importance to the general welfare of the nation at large. A patent for a useful invention or discovery is not, as many persons contend, an injurious and unjustifiable monopoly. It is, in reality, nothing more than a contract between the inventor and the Government, representing the general public. The conditions of this contract are, that the inventor shall produce some new and useful invention or discovery, hitherto unknown, and shall communicate to the public a full knowledge thereof, by means of a proper application for letters patent, in order that the public may be enabled to know what the invention is, and to practice it after the patent expires. On the other hand, the Government grants to the inventor the exclusive right to practice his invention or discovery for a limited time, and this grant the Government agrees to sustain and enforce by means of its courts.

If it be admitted that this policy is a sound one, it follows that the laws should be so framed as to encourage invention, by affording every possible facility for obtaining patents, and for protecting the rights of the owners of such patents during the period for which they are granted. Furthermore, the administration of the patent office should be in accord with the spirit, intention and purpose of these laws.

In our opinion the patent laws of the United States are in their general character superior to those of any country in the world. The intention of the law is that a thorough and systematic examination shall be made, in order to establish the novelty of every alleged invention, before a patent is granted to the inventor. It is, perhaps, too much to expect that such an examination should be in all cases absolutely perfect, and we freely admit that they are now often very imperfectly made; yet we are far from agreeing with our neighbors of the *Scientific American*, who argue from these facts that the present examination into the novelty of alleged inventions should be done away with altogether, and a patent granted as a matter of course to every applicant, as is done in Great Britain and several other countries. There is no doubt that under the present system of publishing the drawings and specifications, and by having the back drawings and specifications of all patents printed in a form accessible to the public, combined with a classified digest or abstract of all patents which are or have been issued, as is done in Great Britain, it would be possible to prevent almost entirely the grant of any invalid patents. To be sure, it might require a higher grade of examiners in the Patent Office, whose salaries would need to be sufficient to induce them to remain permanently in the service, but

it would be entirely proper to meet this additional expense by an increase in the patent fees, if necessary. It costs far less to pay double fees in the Patent Office than to be involved in endless litigation, which is sure to be the fate of every inventor having a meritorious invention, under a loosely administered or defective patent law.

But, notwithstanding the excellence of our present patent laws in the main, they are exceedingly defective in many of their details. As all improvements in the system must necessarily commence with the fundamental law, we desire to aid in the work of bringing about a reform by calling attention to a few of its more prominent defects. One of the most serious of these is in relation to reissues, in reference to which the *Scientific American*, of Dec. 19th, contained the following very pertinent observations:

Nothing is more important to him (the inventor) than the right to amend his patent through a reissue. Rarely does a patent, as first obtained, embody the invention in a fully available shape, and often is its real gist mistaken altogether. The common law authorized amendments by means of a surrender and reissue, and the statute regulated and rendered more definite the rights of the patentee in this respect. The great purpose, in both cases, was to limit the new patent to the real original invention, giving the full benefit thereof to the inventor, but nothing more.

To guard against abuse and to prevent a patentee from enlarging the scope of his patent, or from bringing in a new subject matter through a reissue, the courts have—rather severely—held that oral proof of the full scope of the original invention was inadmissible, and that nothing could be claimed in the reissued patent unless either the model, the drawings, or the specification—as originally filed—showed the invention thereof.

The new law (of 1870) has taken a most indefensible step in farther limitation of a previously existing right, by rendering the most reliable of record evidence wholly incompetent in such cases. The model or drawings may still be called as witnesses, but not the specifications. No matter how fully or how clearly the invention may be set forth in the latter, still, in cases where there is drawings, nothing can be claimed in a reissue which is not shown in those drawings or in the model. A credibility is thus given to a *sign* or a *mute device*, which is absurdly denied to a *written declaration*. Pantomime is regarded as more reliable than articulate language. This is all wrong.

Another absurd requirement, which was interpolated into the law of 1870, provides that the specification of an application for reissue must be sworn to by the inventor, if he be living, and this, it is to be observed, even if he has no interest whatever in the patent at the time of the application. In fact, his interests at some subsequent time may be and often are such as to make it an object for him to prevent such a reissue, and to render his original patent as "inoperative and invalid" as possible.

As a specimen of the practical operation of the present law in relation to reissues, a case occurring within our knowledge is in point. An inventor took out a patent under the law of 1870, in which the model and drawings showed but one method of operation, embodying the leading principle of the invention. A very obvious modification, to be used under certain specified conditions, was described in the clearest manner in the specification, but it was not thought necessary to claim it in the original application. A subsequent applicant obtained a patent, which embodied the modification referred to in the drawings, but he did not claim it as his own invention. The first applicant then applied for a reissue, claiming the feature in question, as he had a perfect *legal* right to do, which claim was denied him under the letter of the statute of 1870. He then applied for a second patent covering the device, which was granted him. Then the second applicant reissued his patent and obtained a claim on the same device, on the strength of having shown it in his drawings. This left no resource to the owners of the patent of the original inventor but to reissue his second patent and apply for an interference, which they were unable to do, because the original inventor, though living, had removed to some distant and unknown locality; the only alternative being that of going through an expensive course of legal proceedings in order to establish their rights. All this trouble,

delay and expense to the original inventor and his assignees was the direct result of the two preposterous provisions inserted in the act of 1870, to which we have above called attention.

It is due to the late Commissioner LEGGETT to state—what we know to be the fact—that he has used every effort during the past two years to procure a repeal of the above, as well as several other objectionable provisions of the patent laws; but, unfortunately for inventors, Congress has been so busy in attending to salary grabs and various other schemes of plunder, that they have thus far found no time to take action on the bill for that purpose, although it has been before them during the last two or three sessions.

Every inventor who reads this should make it a point to stir up his member of Congress, and see if a reform cannot be brought about in this matter during the present session.

While upon this subject, we may remark that we have never been able to see the sense of the decree that a model shall be furnished with every application filed in the office. In many cases it is a most troublesome requirement, especially to the poor inventor, as it frequently entails a larger expenditure of time and money than all the other conditions combined, and renders it necessary to have a stupendous and costly building at Washington, for the purpose of furnishing house room to an enormous number of models, the greater part of which are not of the slightest earthly use to anybody. A very large number of the applications for patents are of such a nature as to be much more clearly shown in a good drawing than they can be in a model; and we are of the opinion, if this requirement were abolished altogether, and a more strict supervision exercised over the character of the drawings, the public welfare would be subserved. Such a measure would tend to improve the character of the drawings, and render it necessary that they should be as clear, full and distinct as possible, and with a sufficient number of figures to thoroughly illustrate the invention. As ninety-nine persons out of a hundred who wish to inform themselves in regard to any particular patent have no means of doing so except by recourse to the drawings, great strictness should be exercised in requiring fullness of detail. If this were properly done, as it is to a great extent in Great Britain, the necessity of illustrative models might be altogether dispensed with, as in fact it always has been in that country.

We scarcely need apologize for having devoted so much space to this discussion, as it is one of interest to a large number of our readers, as well as a matter of great importance, not only to them, but to the inventive public at large.

The Eleventh Volume of "The Telegrapher."

WE present in this number of THE TELEGRAPHER our Prospectus for the Eleventh Volume, which commences with number 442, for January 2d, proximo.

It will be seen that all the valuable features which have heretofore characterized the paper will be retained in the coming volume. No labor or expense, warranted by the patronage received, will be spared to not only maintain the character of the publication as a first class independent telegraphic journal, but to add to its importance, value and interest during the ensuing year. Its columns are enriched by the contributions of some of the best and most experienced electricians and telegraphers of the country, and it presents a complete weekly record of all matters of interest in connection with the telegraph in this country and the world. Its columns will continue as heretofore to be freely open to the discussion of all telegraphic matters, and electrical science in its relations with the telegraph.

The commencement of a new volume with the New Year affords an excellent opportunity for new subscriptions, as well as for renewals of those which expire with the present volume, and the attention of telegraphers and others is invited to the liberal terms offered to those who may exert themselves to maintain and increase its circulation.

It should be remembered that THE TELEGRAPHER is no ephemeral publication, but is a thoroughly established and successful journal. The indications for its future are bright and encouraging.

New subscriptions and renewals made at any time previous to the New Year will be commenced with the first number of the new volume, the intermediate issues being sent free. After January 1st the postage will be prepaid by the publisher, without increase in the price of subscription.

Personals.

Mr. H. DEMING, station agent and operator at Manchester, Vt., is on leave of absence. Mr. A. B. CONNER, night press operator from Rutland, supplies the vacancy.

Mr. GEO. W. METCALF, press operator at Montpelier, Vt., during the two months' session of the Vermont Legislature, is at present subbing at Rutland. Upon Mr. CONNER's return from Manchester Mr. METCALF takes the place of Mr. FRED. W. LIVINGSTON, manager at Burlington, Vt., for a few weeks.

Mr. CHARLES DAY, and Mr. IRWIN of Toronto, Canada, have accepted positions on the night force, Western Union office, St. Louis, Mo.

Miss FLORA COATES has been appointed to a position on the day force in the Western Union office at St. Louis, Mo.

Mr. H. C. MAHONY, of St. Louis, Mo., has been appointed manager of the Western Union office at Denison, Tex.

Mr. E. F. DRAKE has been appointed manager of the Western Union office at Wachita, Kan.

Mr. JOHN E. POWERS is taking night report in the Western Union office at Topeka, Kan.

Mr. JOSEPH MCELVAIN is employed on the night force of the St. Louis, Mo., Western Union office.

Mr. C. T. DAY has resigned his position with the Atlantic and Pacific Telegraph Company, at 198 Broadway, New York, and accepted a situation in the Western Union office at St. Louis, Mo.

Foreign Telegraphic Notes.

THE liquidators of the British Indian Submarine Telegraph Company, the Anglo-Mediterranean Telegraph Company, and the Malta Telegraph Company, have issued their final report for presentation to the meeting on the 3d proximo. They state that all the concessions, property, and liabilities of the companies have been transferred to the Eastern Telegraph Company (Limited), and that the undertakings are fully wound up, in accordance with the terms of the resolutions of the 3d October and 1st November, 1872.

The traffic receipts of the Western and Brazilian Telegraph Company, for the four weeks ended Nov. 20th, were £9,076.

The West India and Panama Telegraph cable, which was damaged in the harbor of Aspinwall by the German mail steamer dragging her anchor, has been repaired.

More Trouble about the Lease of the Franklin Company.

THE New York World learns from Boston that Mr. G. B. Williamson and seventy-four other stockholders in the Franklin Telegraph Company have petitioned the Supreme Court of Massachusetts for a dissolution of the said company, and the appointment of a receiver of its property and assets, to pay its debts and divide the proceeds among the stockholders. The petition was filed 8th inst., and asserts that the Atlantic and Pacific Telegraph Company, having acquired a controlling interest in the Franklin Company, has removed its books and records to New York, where it refuses the stockholders any access to them. It impugns the legality of the lease of the Franklin recently announced by the Atlantic and Pacific Company, and asserts that the stockholders in the Franklin are defrauded of their just rights, and therefore prays that the lease may be vacated and the receiver appointed as above stated. Yesterday, 11th inst., the Supreme Court of Massachusetts appointed a hearing of this petition for the first Monday of February.

Mayor Wickham's First Official Act.

In Nassau street, near the Post-office, stands a telegraph pole that obstructs the pavement. Mayor Wickham ran against it the other day, and declared, while

rubbing his forehead, that the first act of his official life should be to make the Western Union Company remove that pole.

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Dec.	WESTERN UNION.		ATL. AND PAC.		AMER. DIST.		GOLD AND STOCK.	
	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.
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11	82½ ... 83	18½ ... 20	39¼ ... 40	62 ... 75				
12	82 ... 82½	17 ... 19¼	39 ... 40	62 ... 75				
14	82 ... 82¾	17 ... 19¼	39 ... 40	62 ... 75				
15	82 ... 82¼	18 ... 19¾	39 ... 40	62 ... 75				
16	82½ ... 82¾	18 ... 19¾	39 ... 41	62 ... 75				

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st 1871, including drawings, specifications and claims in full sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5503, New York City.

For the week ended November 17, 1874, and bearing that date.

156,920.—ELECTRO-MAGNETIC MOTORS. C. J. B. Gaume, Brooklyn, N. Y. Filed Dec. 29, 1873.

Claims that by use of rounded poles and U shaped armatures greater force is obtained, attraction of side as well as of face of core being utilized.

In an electro-motor, the combination of the magnets having the rounded and tangential polar extremities and the double U shaped armatures, substantially as set forth.

156,942.—MAGNETIC MOTORS. G. M. Phelps, Brooklyn, N. Y. Filed Oct. 8, 1874.

The contact point on the lever *f* is kept bright by contact with the wheel *h*, revolving in oil. That part of the circuit closing wheel which runs in contact with the frame being of smaller diameter than the part running in contact with the commutator springs, a partial slipping movement over the springs is produced, thus keeping them free from dirt.

1. The wheel *h*, revolved in oil or similar material, and forming one of the circuit closing points, in combination with the lever *f*, forming the other part of the circuit closer, and a governor for opening or closing the circuit, according to the speed, substantially as set forth.

2. A commutator composed of a range of springs, *s*, and a circuit closing wheel, *n*, running in contact with a circular bearing, when the said wheel is of different diameters at the two points of contact, for the purposes set forth.

3. The ring segments *m*, connected by insulated studs with the circuit closing springs *s* and with the electro-magnets *a*, in combination with a circuit closer *n*, revolving in contact with the commutator springs *s*, substantially as set forth.

156,969.—CLAMPS FOR TELEGRAPH WIRES. Geo. A. Beach, Toledo, Ohio. Filed Aug. 12, 1874.

The wire to be clamped is laid upon the ledge, when the lever forces the sliding block down, the latter being guided by the inclined slot.

The portable clamp herein described, for clamping telegraph wires, rods, etc., consisting of the plate or body *A*, formed with the serrated flange or bed *A'* and slots *F* and *F'* clamping block or jaw *B b*, and lever *C D a*, all constructed, arranged and adapted to operate substantially as and for the purposes set forth.

[ADVERTISEMENT.]

A Card.—The Metallic Galvanic Battery.

In reply to our former card, Edwin Eagles has published a statement, in which he alleges that our assertions in regard to the METALLIC GALVANIC BATTERY are false, and intended to mislead the public, and prints our contract with him as evidence of our recognition of his claim as the original inventor of said battery.

In said contract it is provided that we shall have the exclusive right to manufacture and sell said battery for seven years, it being premised that he is the inventor "of a new and useful improvement in electrical batteries, for which he has applied for letters patent of the United States," etc.

It is provided in the third specification of the contract that "they (we) will keep, or cause to be kept, a just and true account of all moneys received for the manufacture and sale of said improved electrical battery, under said letters patent," and pay him a royalty of ten per centum of the gross amount so received.

When the contract was made we believed that Eagles was the original inventor of the battery, and anticipated no difficulty in his procuring a patent therefor. The application was rejected by the Commissioner of Patents, as before stated; and, notwithstanding our efforts to obtain for him the grant of a patent, we were unable to do so, the invention having been anticipated by the inventor, whose application is now pending.

If Eagles was not the original and first inventor, and could not legally obtain a patent, of course our agreement to pay a royalty to him was invalid.

His statement that his patent will soon be issued he knows to be false, and even if it be so issued, we shall

have for some years the exclusive right to make and sell the battery under the terms of his contract with us—our part of which will be strictly performed when he gets a valid patent on the invention.

We do not propose to bandy epithets with Eagles, whose only object is to injure our business, and who is now well aware that he is not the first inventor, and can never get an original patent for the invention.

F. L. POPE & Co.

New York, Dec. 17, 1874.

PHILADELPHIA.

L. G. TILLOTSON & CO.

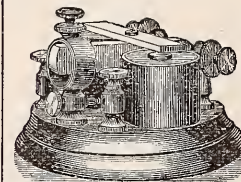
beg to announce the opening of an establishment for the sale of

TELEGRAPHIC AND ELECTRICAL GOODS of every description, at

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They solicit the patronage of their friends and the telegraphic fraternity generally.



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from

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Send for circular.



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IMPORTANT NOTICE.

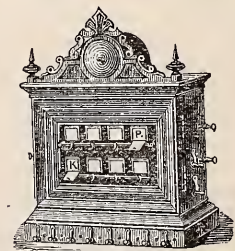
After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,

No. 40 WEST EIGHTEENTH STREET;
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L. G. TILLOTSON & CO.,
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We invite TELEGRAPH MANAGERS AND OPERATORS throughout the country to act as our agents for the introduction of our superior BURGLAR ALARMS AND ANNUNCIATORS into private houses, hotels, banks, &c. Upon receipt of plans of houses we will send skilful mechanics to estimate upon work, or will give any information in writing that may be required. Liberal commissions will be paid upon any orders that may be secured for us. Our Alarms and Annunciators have just been awarded the FIRST PREMIUM of the American Institute.

Explanatory Circulars will be furnished upon application to the Secretary.

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 to order. Second hand instruments for sale cheap,
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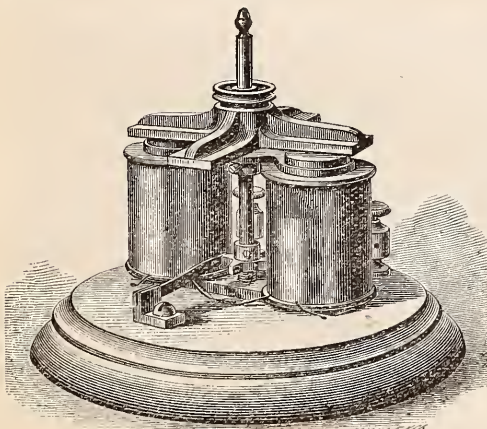
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 elegantly finished and mounted on highly polished rosewood,
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THE FAIRY ELECTRIC ENGINE.

A perfect working model of an engine
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 It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery.....\$6 00
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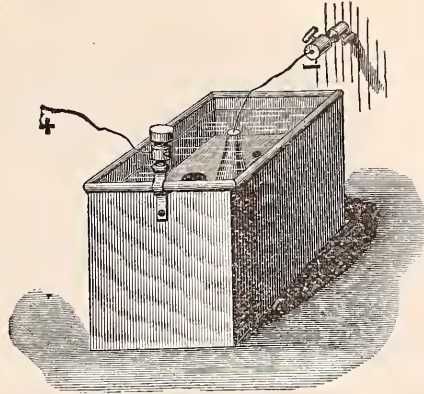
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PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for
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now offer them to the public as the best Battery for Telegraphic
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The Battery cell is made of *lead*, and forms one pole of the
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These Batteries have been fully tested during the last year,
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Two sizes are made at present, but others will soon be ready.
 No. 1 is a large square cell, and can be used as a local or for
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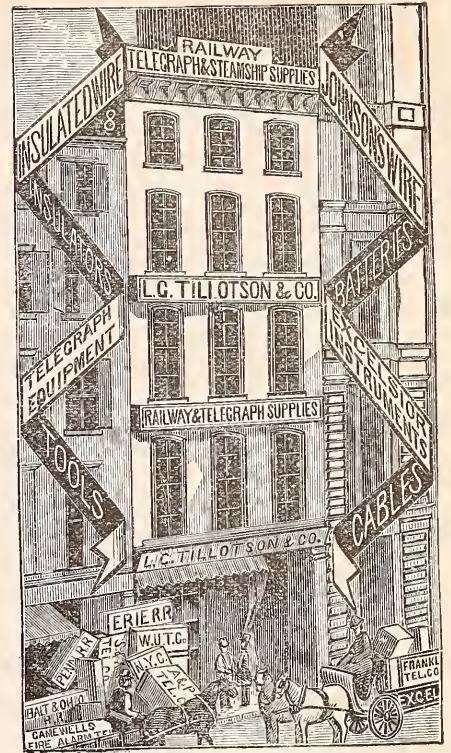
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UPON THE AUTOMATIC PLAN,

is now in operation in the following Cities, to which references
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UNIFORM RELIABILITY.

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St. Louis, Mo.,
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San Francisco, Cal.,
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Toronto, Canada,
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Worcester, Mass.

The Distinctive Features of these Systems of

Fire Alarm and Police Telegraphs

ARE,

First—The **Automatic Repeater**, through which the apparatus may be distributed in a combination of circuits, and the entire system successfully worked, without the constant personal attention of either operators or watchmen.

Second—The **Automatic Signal Boxes**.

Third—The **Electro-Mechanical Bell Strikers**, adapted to produce the full tone of the largest church or tower bells.

Fourth—The **Electro-Mechanical Gong Striker**, for hose and engine houses, by means of which the location of the fire is instantaneously communicated to the members of each fire company.

These Features combined form the

Only **PERFECT, COMPLETE** and **RELIABLE** System

OF

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It is a sufficient vindication of the claims which are made by the Proprietors of these systems of

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that they have sustained the test of more than twenty years of practical use, and that the efforts which have been repeatedly made to supplant them by other inventions have

COMPLETELY FAILED;

the few instances in which municipalities have been induced to adopt other systems having demonstrated their insufficiency and unreliability, and resulted in their abandonment, and substitution therefor of the

AMERICAN FIRE ALARM TELEGRAPH.

Messrs. GAMEWELL & CO. are the owners of the original *FARMER & CHANNING PATENTS*, one of the most important of which has just been extended for seven years, and during the past seventeen years have spared no expense or effort to secure improvements, and the Systems are now covered by

MORE THAN TWENTY PATENTS.

The most important improvement which the Proprietors have adopted and introduced is the

AUTOMATIC SYSTEM,

the introduction and operation of which involves so little expense, compared to the benefit which it confers, that even small communities can profitably adopt and maintain it.

The American System of

FIRE ALARM AND POLICE TELEGRAPHS

has met with the universal approbation and commendation of the

People, Municipal Authorities,

AND THE

PRESS

throughout the UNITED STATES and CANADA.

NO EFFORT, TROUBLE OR EXPENSE

is spared by the Proprietors to obtain and secure ANY POSSIBLE IMPROVEMENT which shall increase the

EFFICIENCY,
RELIABILITY and
ECONOMY

of the system. They intend that, as far as possible, it shall be

ABSOLUTELY PERFECT!

The amount of property which has been saved from destruction, and the number of lives which have been preserved through the general adoption of this system, throughout the UNITED STATES and the DOMINION OF CANADA,

CANNOT EASILY BE ESTIMATED,

but that, in every community where it has been introduced for any considerable length of time, they have been enormous, **THREE CAN BE NO QUESTION.**

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Any information desired in regard to the above system will be cheerfully and promptly furnished upon application at the office.

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These instruments are now made in two different styles, at \$120 and \$135 a set, consisting of two Relays, two Sounders, two Keys and Governor.

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a most compact and reliable Switch, forming a clean spring-locked connection between any number of wires, occupying for each different connection only one square inch of space, and though made of the largest size, not subject to the warp and contraction of wood-work.

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COMPOUND RUBBER COVERED WIRE

SUBTERRANEAN & AERIAL WIRES,

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HIGHEST INSULATION.

We are now prepared to furnish, after an experience of three years, an Insulated Wire which can be buried in the earth or exposed to rain and sun, or to the vapor of acids, without injury. Professor SILLIMAN, who has exposed it to the most destructive agencies, finds that it remains uninjured in an atmosphere of ozone, which would destroy gutta-percha in a few hours. It exceeds glass or any other known substance as a non-conductor

We have made special arrangements to furnish this article for office purposes at a reduced rate.

ALSO, TO FURNISH

IRON CLAD CABLES

of the usual size, with KERITE COVER, believing that it will exceed, in insulation for submarine purposes, ANYTHING HITHERTO MANUFACTURED.

We shall be happy to furnish estimates for any amount and size of cable, which will be found to compete with any other construction, both in quality and price.

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We offer for sale, among other novelties, a SOUNDER that will work practically with a single DANIELL cell, a BATTERY that does not require to be taken down but once a year, and the very best MAIN LINE SOUNDERS made

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AND EVERY VARIETY OF
ELECTRO-METRICAL APPARATUS MANUFACTURED BY SIEMENS BROS.

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THE PATENT INSULATOR.

This invention was first introduced into public use in 1867, and now hundreds, without exception, attest its perfection as an insulator; also its economy over all others when maintenance is included with first cost.

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This instrument for the measurement of ordinary resistances, such as relays, sounders, conductivity of line wires, insulation, &c., stands unrivalled for simplicity and correctness, and is now the standard instrument for such work in all countries.

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Insulated Conductors.

These Cables are unexcelled in construction, and can be procured in less time and at about half the cost of those manufactured in this country.

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The undersigned is now prepared to supply the improved and superior

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manufactured under the patent of Mr. J. E. SELDEN. This instrument has already been extensively introduced, and has given complete satisfaction to all who have adopted and used it. It is SIMPLE, RELIABLE, and not liable to get out of order; can be operated by any person of ordinary intelligence after a few minutes' instruction and practice.

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Favorable arrangements will be made with line constructors, telegraph employés, &c., for the introduction of the Printer.
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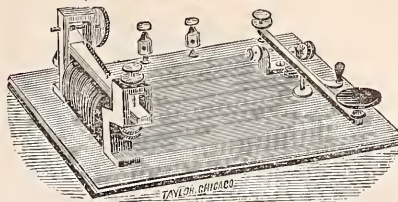
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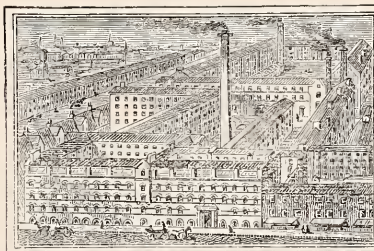
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Key and Sounder only..... \$6 50
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- No. 15. THE QUEEN. *Point extra fine.* Admirably adapted to all kinds of Fine Writing.

Sample Cards containing all the FIFTEEN Numbers, securely inclosed, will be sent by mail on receipt of 25 cents.

IVISON, BLAKEMAN, TAYLOR & CO.,
138 & 140 Grand street, N. Y.

THE TELEGRAPH MONITOR:

A REVISE AND ENLARGEMENT OF THE
TELEGRAPH MANUAL,

BY
TAL. P. SHAFFNER, LL. D.,

Author of "Telegraph Companion," "Telegraph Manual,"
"History of America," "Civil War in America;" Member
of many Scientific and Learned Societies of Europe
and America; Commander of the Order of Dan-
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Norway, and of the Sword Order,
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This great telegraphic work will consist of five volumes, 80
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3,000 ILLUSTRATIONS.

The author has undertaken this important publication at his own expense, and he hopes telegraphists throughout the world will accord to it a patronage commensurate with its merits. For nearly thirty years the author has been connected with the telegraphic systems of both hemispheres and an observer for general instruction, and this work will contain the substance of facts thus collected, having especial reference to practical telegraphy.

The first four volumes will be ready for printing in May, and the whole work may be issued in monthly parts of quarter or half volumes.

Vol. I will contain a general history of electrical discovery by ancient and modern philosophers—the experiments of Otto Guericke, Hawksbee, Gray, Wheeler, Du Fay, Muschenbroek, Franklin, Canton, Dalibard, Watson, Cavendish, Coulomb, and others who practically manipulated static electricity; the whole prepared especially for the telegraphists as useful information in pursuing the art of telegraphing.

Vol. II.—A full account of the discovery of the Voltaic battery, and the many improvements and modifications of this telegraphic generator of electricity, considering the experiments of Galvani, Volta, Cruikshanks, Daniells, Wollaston, Bunsen and Grove. Also, magneto and thermo electricities, and the application of their respective forces for telegraphic and useful purposes.

Vol. III.—In this volume will be considered Terrestrial Magnetism, Aurora Borealis, Magnetic Needle, Ships' Compass, and Magnetic Phenomena generally. Also, Electro-Magnetism as discovered by Ørsted and manipulated by Schweigger, Ampère, Arago, Sturgeon, Henry, Faraday, Jacoby and others. The application of these discoveries for practical telegraphy by inventors, from time to time.

Vol. IV.—A general history of the ancient and modern telegraphic systems, semaphoric and electrical, including telegraphs of Chappé, Le Sage, Roulard, Cooke, Wheatstone, Davy, Steinhell, Morse, Bain, House, Hughes and others. Also, the construction of overland, subterranean and submarine lines, including conductors, insulators, paratonnerres, and telegraphic implements generally.

Vol. V.—This volume will give a full account of the various telegraphic apparatuses for simple and automatic manipulation; the combination of circuits for repeating or translating; double and duplex transmission. It will also contain a large amount of general information for practical telegraphists, respecting conducting and non-conducting compositions, tables, and a Dictionary of telegraphic technical terms.

The whole work will be written for the telegraphist, but it will not be mathematical. The illustrations are designed for specific instruction, and their explanation concise. It will be so arranged that either one of the volumes may be bought by those not wanting the whole.

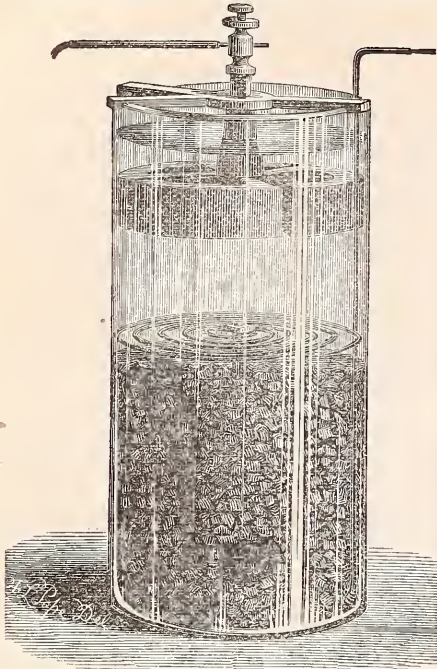
Each volume will have a complete Table of Contents and an Index.

The above must be regarded as an approximate division of the subjects.

As the work progresses further notice will be given.

The publishers will be announced hereafter

THE PERFECT BATTERY.
CLEANLINESS. CONSTANCY. ECONOMY.



THE
LOCKWOOD BATTERY,
PATENTED APRIL 8, 1873,
L. G. TILLOTSON & CO., Sole Agents,
No. 8 DEY STREET, N. Y.

This Battery has been in extended practical use for more than a year, and is now acknowledged by leading Electricians in this country and Europe to be
FAR SUPERIOR TO ALL OTHERS
for telegraphic purposes, or closed circuits of any description. This Battery received the **FIRST PREMIUM** over all competitors for

POWER, DURABILITY AND ECONOMY
AT THE
CINCINNATI INDUSTRIAL EXPOSITION OF 1873.

The size shown in the cut (No. 2), when charged with 5 lbs. sulphate of copper per cell, is capable of working two or three main circuits of average length for **MORE THAN ONE YEAR**, without any attention whatever. The copper and zinc solutions are perfectly separated, and there is

NO LOCAL ACTION,
and the circuit is **ABSOLUTELY UNIFORM** at all times. It is equally well adapted for a

LOCAL BATTERY,
or for any purpose requiring a uniform, powerful and constant current.

The number 2 size (price \$2.50) is now ready for sale. Other styles are in preparation, and will soon be put on the market.
Send for Circular.

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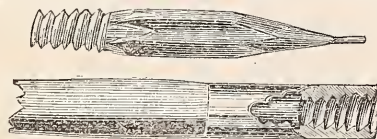
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SOLE AGENTS.

New York, Oct., 1873.
We have appointed Messrs. L. G. TILLOTSON & Co. Sole Agents for the sale of the Lockwood Battery.

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W. H. SAWYER, Secretary.

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"SAVE THE PIECES."

This **HOLDER** is intended to save the last half or third of the pencil.

DIRECTIONS.

When the pencil becomes too short to write with comfortably, shave down the butt and screw into the Holder. The screw makes its own thread, and will hold the pencil perfectly firm.

Price, 25 cents each.

Sent by mail on receipt of price.

Price per doz., \$1.80.

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INSULATORS and SUPPLIES.

Annunciators for Hotels, Steamships, Dwellings.

Our Annunciators are the most extensively used and the most perfect in operation.

Automatic Mercury Fire Alarm, for Hotels, Steamships, Public Buildings.

Five years' operation have proved its merits.

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UNION BRAND, AND

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JOHNSON'S WIRE.

BROOKS' INSULATORS, GLASS INSULATORS and BRACKETS.

KENOSHA INSULATORS, all kinds.

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KENOSHA CROSS-ARMS.

OFFICE WIRE, many varieties.

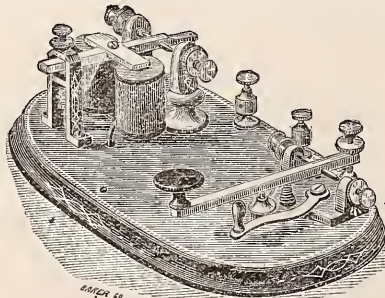
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PRIVATE LINE INSTRUMENT.



Price, \$8.00.

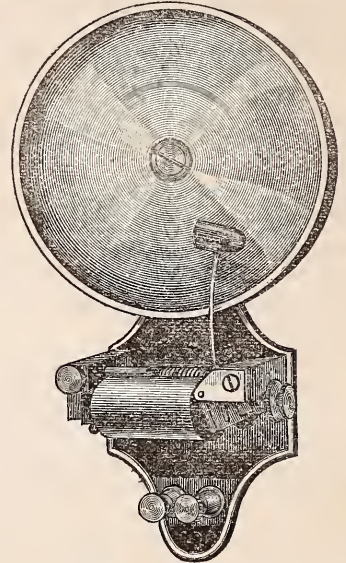
This Instrument is well finished, and gives a clear, loud sound. It is made to work on a line from a few feet to ten miles in length. In ordering, give resistance of line and number of other instruments in circuit.

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One half of actual size

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PATENT SELF-CLOSING KEY,

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Price. \$5 50

The lever of this Key swings in two directions, vertical and horizontal. A spring presses it against an adjustable contact point on right hand side.

In sending with this key take hold of the knob and move to the left, this opens the circuit, then operate in the ordinary way. As soon as released the lever swings back against side contact point, closing the circuit.

The Platina Points are large and hard.
Self-Starting Register, of new design, protected by a Glass Shade, complete, with Paper Reel and Weight. . \$50 00

Sounders, from. 4 50 to \$6 50

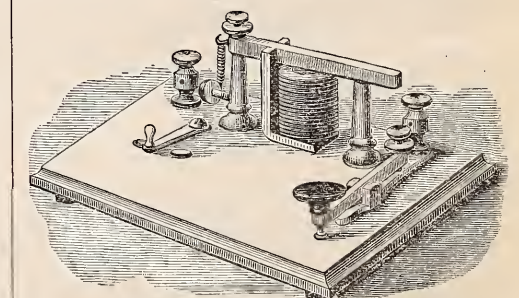
Electric Bells, single stroke or continuous ringing, from. 5 00 to 8 00

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Improved Switch Keys, from. 3 00 to 5 50

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The above may also be had of F. L. POPE & CO., 38 Vesey street, New York, at Manufacturer's prices.

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NEW AND IMPROVED, WITH STRAIGHT LEVER KEY.



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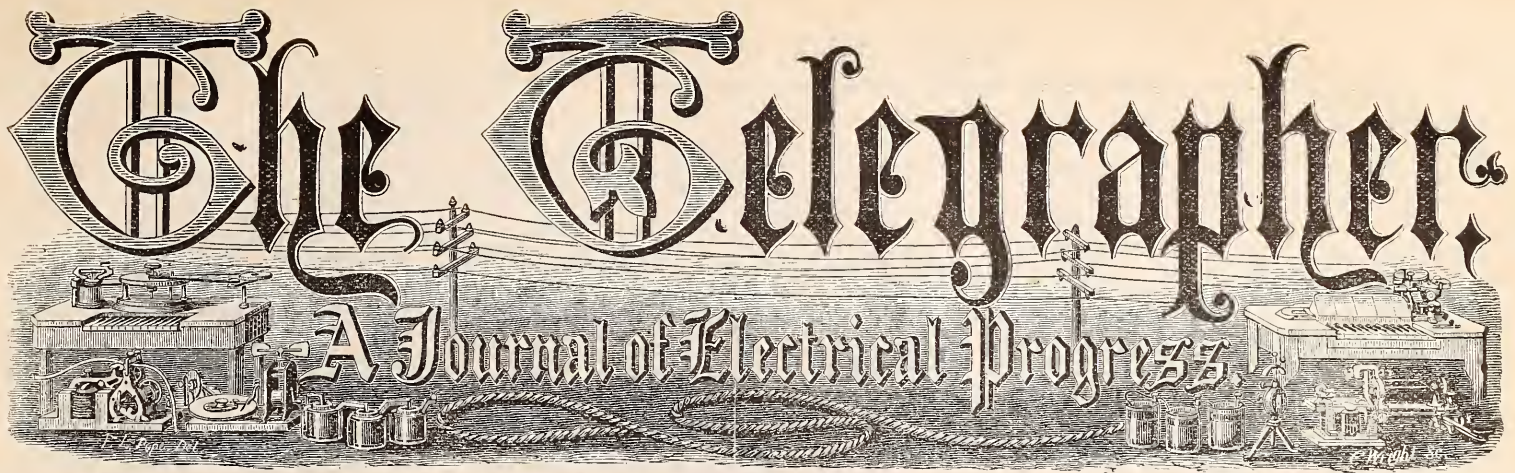
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The Telegrapher

A Journal of Electrical Progress.



Vol. X.

New York, Saturday, December 26, 1874.

Whole No. 441

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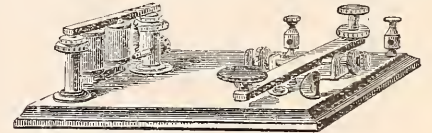
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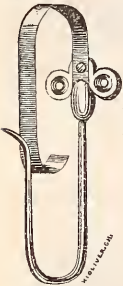
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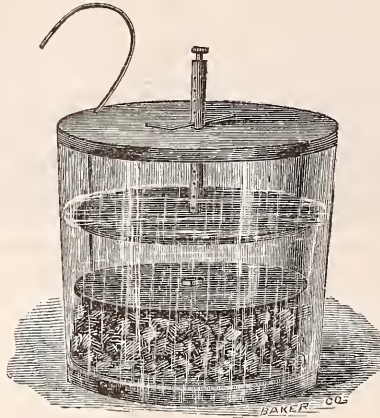
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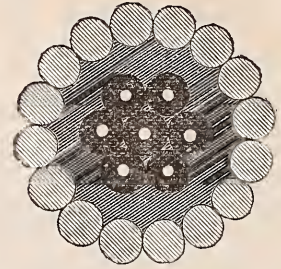
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THE TELEGRAPHER

A JOURNAL OF

ELECTRICAL PROGRESS.

J. N. ASHLEY, PUBLISHER.

SATURDAY, DECEMBER 26, 1874.

VOL. X. WHOLE No. 441.

Original Articles.

The Automatic versus the Morse System of Telegraphy.

I HAVE read with much pleasure the excellent communication of a correspondent under the signature, "Morseite," in THE TELEGRAPHER of December 19th, which pleasure was not at all lessened by the fact that my own conclusions, so far as I have had the necessary time and opportunity to look into the matter, differ materially from his. I have taken but little part, thus far, in the controversy which has been for several years in progress between the respective advocates of the Morse and Automatic systems, principally because I did not like the spirit in which it has been carried on. Instead of argument we have had recriminations and appeals to individual and class prejudice; while instead of facts, we have had theories and extravagant assertions, and this has been too much the case on both sides.

This correspondent has written in a commendable tone of moderation and fairness, and I trust his example may be followed by others who have anything to say on either side.

The whole question lies in a nutshell. If, by means of the Automatic system, the telegraphic business of the country can be transmitted as promptly and correctly as by means of the Morse system, with its present and prospective improvements, and the work can be done by the former at any material reduction of expense, then the general introduction of the Automatic is only a question of time. That it will in any event supersede the Morse system entirely I do not consider at all probable, but it is certain that nothing any of us may say or think on the subject will influence the final result. The editor of THE TELEGRAPHER seems to think that the introduction of the Automatic system offers the only probable solution of the vexed problem of cheap telegraphy, and for expressing what is doubtless his honest conviction, an attempt has been made to prejudice the telegraphers of the country against him, on the ground that he is opposing their interests, an assertion that comes with a peculiar ill grace from a journal apparently run in the interest of, if not owned by a party who has probably made more money out of Automatic telegraphy thus far, than any other man in the United States.

But I intended in this communication merely to glance at the relative capacity and expense of the two systems, as the matter presents itself to my mind.

The rate of speed at which wires are actually worked is a matter of endless dispute when discussing this subject. I give below the result of six consecutive days' actual work, taken from the records of the New York Western Union office in 1868:

MORSE CIRCUITS.

Wires.	No. Messages.	No. Words.
No. 1, to Chicago	2,088	64,728
" 3, " Buffalo	1,267	39,654
" 7, " Boston	508	55,948
" 4, " Baltimore	839	40,534
" 11, " Washington	1,051	33,682
Total for 6 days	5,753	234,546

PRINTING CIRCUITS.

Wires.	No. Messages.	No. Words.
No. 5, to Albany	1,308	41,108
" 1, " Boston	1,948	79,638
" 10, " do	1,719	61,979
" 1, " Washington	1,866	76,342
" 7, " Philadelphia	1,639	52,509
" 8, " do	1,754	55,174
Total for 6 days	10,234	366,750

If we suppose each wire worked to its full capacity from 9 A. M. to 5 P. M., it would give a total of 240 hours per week for the Morse circuits, and 288 for the printing circuits, and the average result would be as follows:

Morse, average per hour.....	977 words.
Printing, " "	1,273 "

The circuits included in the above statement were at that time the busiest ones in the New York office.

During the year 1872 several instances of first class work on regularly numbered messages were timed, of which I take a few of the best:

MORSE CIRCUITS.

330 messages in 6 hours 30 min....	50.7 per hour.
136 " " 2 hours.....	68. " "

PRINTING CIRCUITS.

606 messages in 7 hours, 86.5 per hour.
700 messages in 8 hours 45 minutes, 80 per hour.

Some of the best work in this country has been done in transmitting the President's annual message from Washington to New York. The time recorded is as follows:

Year.	No. Words.	No. Wires.	Time.	Average per hour.
1872	11,339	12	45 mins.	1260
1873	10,635	8	59 "	1368

If we therefore put the best Morse transmission at 1,368 words per hour, and divide it by the greatest number of messages per hour given above, which is 68, it gives us an average of 20.1 words per message, which is probably very near the truth. This would give us as the present attainable speed, in actual work, on a circuit of 250 miles, say:

Morse, 1,368 words per hour.
Printing, 1,738 words per hour.

Now let us see if we can approximately get at the cost of transmission by the Morse system, under favorable circumstances, on a 250 mile circuit. We find, as above, that a first class Morse operator can send or receive at the rate of 330 messages in 6 hours 30 minutes, which is 50.7 per hour, say 400 per day of 8 hours. The two operators would cost say \$4 per day each, or \$8 for the two.

We have procured the following figures from official sources: The cost of a good line is not less than \$150 per mile, or \$37,500 for 250 miles. We therefore have:

Interest on cost of line, at 7 per cent....	\$2,625 00
Maintenance of line \$7.70 per mile....	1,925 00
Battery \$1.21 per mile	302 00

Total per year.....	\$4,852 00
Total per day.....	13 29
Add salaries of two operators.....	8 00

Total expense per day of one wire, having capacity of 400 message.....	\$21 29
Cost per message.....	.053

There are, of course, numerous other expenses, such as rent, clerk hire, superintendence, stationery, lights and fuel, etc., which it is fair to suppose will be about equal for either system. If we admit that the duplex is equal to two wires, and the quadruplex to four, which is a very liberal allowance, we would have to estimate for the increased cost of battery and operators only. We should, therefore, have, by the same method of calculation, approximately the following figures:

Cost per message, ordinary circuit.....	.053
" " duplex circuit.....	.037
" " quadruplex circuit.....	.029

If it were possible to work an *octoplex*, the cost per message would be .026, so it appears that, all things considered, there is no great gain in carrying this principle beyond the duplex, for working circuits of ordinary length. On longer circuits the proportionate saving would be greater were it not for the fact that the difficulty of working a complicated apparatus rapidly and continuously also increases in proportion to the length of the circuit. As the number of routes carrying business enough for a quadruplex is not very great, it would seem hardly probable that this system will work the revolution in the telegraph service that your correspondent seems to expect.

The automatic perforating machine now used I have seen worked by an expert at the rate of over fifty words per minute. It can certainly be fingered much faster than the Phelps printer. Each letter is made by a single touch, and it would be entirely within bounds to place the capacity of the machine, in the hands of a good operator, at 2,000 words per hour. The most authentic record I have at hand of the speed of the automatic, is that of the transmission of the President's message and accompanying documents in 1873 from Washington to Pottsville, Pa., a distance of about 240 miles by the line. On this occasion 11,640 words were transmitted in thirty-four minutes, or at the rate of 20,538 words per hour, and I was informed by Mr. Sellers, of Reading, that no special effort was made to send it with unusual rapidity. We may safely allow this rate, after the system is thoroughly established, or say, 20,000 words per hour.

In my opinion the only place where cheap labor will be found available in automatic telegraphy is in the copying. The characters are written with accuracy and distinctness, and with the type writing machines now in use it does not necessarily require a high degree of skill to copy from the telegraphic strips and print the messages at the rate of say 1,500 words per hour. This work can be done at this rate by girls for about \$1.50 per day. The perforating, however, requires ex-

actly the same kind and the same amount of skill as the work of a first class Morse or combination operator.

Now let us see what we can do on one wire by the Automatic system:

Interest on cost of one wire.....	\$2,625 00
Maintenance	1,925 00
Battery	302 00

Total per year..... \$4,852 00

" " day.....	\$13 29
Salaries of 10 perforating operators..	40 00
" " 2 operators at Ins't's....	8 00
" " 14 copyists.....	21 00

Total expense per day..... \$82 29

The number of messages in 20,000 words is, as we have seen, 1,000, which would be 8,000 for a day of eight hours, and the cost would be .0101 per message. This would be less than one third the cost of the duplex, and a little in excess of one third the cost of the quadruplex system.

I think no one will assert that the capacity of the Morse system is underrated in the above calculation; and I am quite sure that every unprejudiced telegrapher who is familiar with the Automatic system will admit that, under a properly organized system of handling business in the offices, equal, let us say, to that of the Western Union, it will be capable of doing certainly as much, and probably considerably more than I have given it credit for.

I have only referred in this article to the working of ordinary circuits of say 250 miles in length, but it is evident, in circuits of 500 miles or more, the comparison would be still more favorable to the Automatic.

If the introduction of the Automatic system should result in the reduction of rates to one half their present amount on all the principal routes, it is evident that a large increase of business will follow, and the whole number of first class men employed would exceed by at least 50 per cent. the number at present required.

I am fully aware that the "cheap labor" propositions of the advocates of Automatic telegraphy have created a strong prejudice against the system in the minds of American operators, but the system itself is not responsible for this.

In fixing the salary of first class operators, as much account is made of experience, good judgment, ability to read copy correctly, etc., as of mere manual dexterity, and all these qualities are as much required in operating an Automatic punching machine as in a Morse or printing instrument.

In regard to the comparative accuracy of the Morse and Automatic systems, much might be said on both sides. I incline to the opinion that experience will prove the latter to be quite as accurate as the former, though probably less so than the printing instrument. This, however, is a question that it is of little use to speculate upon. Only experience can determine the point with absolute certainty.

If I am correct in my estimates of the cost of working the two systems, I do not see how the Automatic can fail to become very extensively employed in the future, either by a new company or by the Western Union, or more likely by both. I must confess that I do not myself think the success of the Automatic will be adverse to the interests of operators. Even if it were otherwise, I see no help for it. If the Automatic system turns out to be the most profitable one, it will eventually make its way into the field in spite of all the opposition that may be brought against it, and if not, it will have to follow the long line of beautiful inventions that had "no money in them," and have consequently been allowed to lapse into oblivion.

Elizabeth, N. J., Dec. 22, 1874.

Retrospective and Otherwise.

By OWTON A. FLYE.

I MARK this 14th day of December, in the year of our Lord, &c., as an anniversary, not commemorative especially of a closing epoch or a dawning era, but indicating, rather, two important and prominent periods in the history of my life and my profession, to wit: the steady gradation, by uneasy stages, from the point where I was the best operator in the universe of God, toward that ultimate where I shall come to know, and of which I have now a remarkable conception, that I am *not* the embodiment of all that is best in the ranks of that calling which I had so fondly hoped to adorn. There was a time, in the very outset of my professional career, when it seemed to be the firm conviction of my soul that earth had no sorrows which my sending could not heal, and that my receiving must have taken many a weary burden from the life of the transmitter with whom it was my duty to be connected. But time and experience have so modified my convictions that now, at this 14th annual contraction of my views in that

respect, the recollection of my former glory has become so indistinct as to raise the question in my mind whether, after all, the circumstances had any foundation whatsoever in fact.

It was partly on account of this, and partly because I was sorry to see a beginner starting wrong in life, that I could not enter into the enjoyment of the affair when young Sneezweed, with his deft fingers still upon the key that had carried dismay to the heart of an unsuspecting victim, and with his mind still inflated with the importance of the transaction, leaned insinuatingly over to tell me that "he had made that snake hunter at Town Line sick." Now, out of all the emotions which thronged my inner consciousness at this announcement, two evolved themselves into unmistakable prominence—one as to the elements and conditions that go to make up a snake hunter, and the other taken up with conjectures as to the nature of the disease with which he, she or it had been visited by this veritable Nemesis.

The former question I dismissed for subsequent consideration, and the latter I soon began to regard as an ailment whose cause and cure were so far removed from the province of *materia medica* as to preclude the possibility of a diagnosis, even at the hands of Esculapius himself.

It will be conceded, I presume, that there comes a time in the life of every person endowed with reasonable faculties for a correct understanding of things—that there comes a time, I say, when he feels that the capacities of his soul are filled, and that constructed as he is, in the frailty of a nature which is simply human, it would be an act of cruelty to add another drop to his cup of joy, now already so replete as to be a positive burden to his being.

I instinctively felt, when Sneezweed spoke to me, that the time had come for me to do reverence to such a sentiment. I had an intuitive knowledge that my young friend was under the spell; and under the influence which seemed to surround the occasion, I did the best thing that could be done in a situation like that—namely—sighed. I comprehended in an instant the complete history of this case, from the time when the principal in it, working assiduously in an unpretentious railway office in the country, and aspiring unswervingly to a commercial one in the city, down to the very moment when the culmination of his hopes had been reached; and when his chair went back to an angle of forty-five degrees, and his eyes closed on the scene for a moment, as if to say, "now, my ambitious soul, he still." I knew that the zenith of his aspirations had been attained, and that earth had no more delectable thing to give him than that hereafter his lifeway might be strewn with flowers, yet no future enjoyment could come to him as substantial as that. Friends might forsake him in the years that were coming, but no desertion on their part could separate his soul from its remembrance of that; and I felt that the critical period of his transmitting life had been reached, and henceforth, when the social knot should be gathered, on dull days, at convenient localities in the office, to discuss the relative merits of its members, Sneezweed would be admired as having achieved the distinction in his profession to say (in the slightest perversion of a western phrase) that he had "sickened his man."

The Lease of the Lines of the Franklin Telegraph Company to the Atlantic and Pacific Telegraph Company Confirmed.

A MEETING of the Franklin Telegraph Company was held in Boston, on Wednesday, Dec. 16, in response to a petition of a minority of the stockholders, representing 3,710 shares, for the purpose of considering the subject of leasing the property to the Atlantic and Pacific Telegraph Company for the sum of \$30,000. W. J. Syms, President of the Company, called the meeting to order and the records of the last meeting were read.

Mr. John R. Bullard, of Dedham, took exception to the records, and contended that he offered a protest verbally before the vote to lease the lines, and then reduced it to writing. He insisted that his protest should have been entered in the order in which it was offered. The vote on amending the records was 1,645 shares to 5,172, and they were approved. A motion was then offered approving the lease to the Atlantic and Pacific at \$27,500 per annum. Mr. George R. Williamson asked for the reading of a letter in which he claimed that he had, in behalf of certain parties, made an offer to lease the line for \$35,000 per year, payable semi-annually, and protesting against the leasing of the line to any parties for a less sum than \$35,000. The President took the ground that no offer had been made by Mr. Williamson. Mr. Williamson read a reply to his letter, in which Mr. Lyons stated that he had no power to lease the line to any other parties than the Atlantic and Pacific Telegraph Company. In reply to a question the President read a letter addressed by him to J. B. Brown, in which he said:

"I think that it is greatly to the interest of the Franklin Company to lease, upon the terms that I have procured for it, for the following reasons: The books of the Company show that a net profit of \$119,135 68 has been earned during the years commencing April 30, 1870, to April 30, 1874. During 23 months of that time the Company had the Signal Service business, which they had not before, have not now, and may not have again, which produced \$54,000 at an extra cost to the Company of \$12,000 for expenses, which, reduced, leaves \$42,000 to be deducted from the \$119,135 68, which leaves \$78,000 for the average earnings of the Company for four years—which is about \$19,000 per year. I can only find that all that time two dividends have been paid to stockholders, and the Company has a round debt of \$9,000 unpaid. To reply, it can be said that the books do show that as much as \$44,000 has been made in one year. Deduct for signal service business, now lost, \$27,000, less its expense, say \$6,000, the result will be for that year \$23,000—a much less amount than has been obtained for the Company by leasing it to the Atlantic and Pacific Company on the terms in the lease. The resolution passed at the stockholders' meeting in November instructed me to lease at not less than \$25,000. I found upon the record of the Company that, at a meeting of the stockholders, held in October, 1873, a resolution passed to lease to the Atlantic and Pacific Company the Franklin Line, at not less than \$25,000. An appeal was made to the Committee of the Atlantic and Pacific Company, that the Franklin Company had incurred indebtedness by reason of contracts for extension of lines, say two lines from Rye Beach to Boston; also, finishing of line from Providence to Newport, and some extensions in New Jersey, which, with the expenses, would amount to \$25,000, or perhaps \$30,000, for which the Franklin should become vested, as the Company had some indebtedness yet to pay besides the rent mentioned, and for that reason the rental of the Company should be increased to \$27,500 per year, which was done, and a clause inserted that, if to satisfy existing contracts more lines had to be built, then the Franklin Company had the right to build the same and get eight per cent. additional rent on the amount expended, up to a rental of \$30,000 per annum. But if the stockholders of the Franklin did not wish to build or incur any more debt, the Atlantic and Pacific Company had the privilege of building and collecting revenue or rent therefrom. The present debt of the Company without the bond is about \$10,000; with the bond, under \$20,000; and \$27,500 per annum for 99 years. That, in my opinion, is much better than the Franklin Company has ever done, and more than the books can possibly show it to be worth.

An ineffectual attempt was made to stave off the vote, after which the vote was taken with the following result: In favor of ratifying the lease, 5,170 shares; opposed, 27 shares, and the lease was declared confirmed.

This ends the matter so far as the lease is concerned, unless the Supreme Court should grant the application pending for a receiver.

Kite Tails and Telegraph Wires.

TO KEEP the telegraph lines free from entangling alliances in a city like New York is no easy task, and the chief of sinners in this respect is the small boys' kite tail. As though presuming on the service to telegraphy rendered by one of their class in the hands of Franklin, these playthings—of future Franklins, let us hope—are incessantly taking liberties with the wires, breaking thereby their own continuity, and endangering the continuity of the messages the wires are intended to convey. To assist the kite tails in this mischievous work naughty boys tie stones to strings and strips of cloth, and then sling them so that they wind round the wires and suspend the stones—a perpetual menace to passers underneath. In this way the wires in many neighborhoods are made to resemble the limbs of an African prayer tree, with its burden of rags, tags and strings hung on hy pious wayfarers.

The effect is not ornamental, nor does it add to the efficiency of the wires, especially on rainy days. At almost any moment on the side streets you may see the telegraph men climbing the poles to remove the strings, or reaching for the nuisances with long rods like stout fishpoles, which they twist among the strings until they are firmly attached, then by main strength strip them from the wires, sometimes at imminent risk of the integrity of the wires and their attachments. We never see the operation without wondering at its clumsiness. Why not burn the strings? It would be an easy matter to attach a light to the end of a slender bamboo pole, so that the flame could be slid along under the wire, charring any string or rag it might encounter, thus dislodging the snarls that are so hard to remove by force. The light could be hung, if need be, so as not to touch the wire or in anyway interfere with the transmission of messages. A simple hook, or a grooved wheel at the top of the

pole, would enable the apparatus to run along the wire so that it would be no trouble to guide it.—*Scientific American.*

Left by the Wayside.—The Adventures of Two Nice Young Operators from Golden.

SUNDAY being a nice, warm sunshiny day—just the day for a pleasant drive—two gay and handsome young telegraph operators of Golden resolved to show their store clothes in the streets of the Capital. After placing themselves in the handsomest "livery rig" in Golden, they shook the lines over a pair of fiery sorrels and drove down over the hills to Denver. After doing the main streets and attracting the admiration of numberless susceptible marriageable young ladies, and the envy of the Denver masculines, they wound up their drive by a whirl along West Larimer street. Unhappy resolve! The team of frisky sorrels resolved upon rebellion just as they crossed the Cherry Creek bridge. At a mutually agreed upon signal they shied to the roadside and dumped the young telegraph operators out upon a lumber pile and trotted on up the street as if nothing had occurred. Reaching the corner of Fifteenth and Larimer streets the mischievous animals pretended to take fright at a street car, and turned the buggy over upon the turn-table, leaving two wheels of the vehicle scattered promiscuously about the streets, and the Golden animals decided upon a hasty flight for home. They went dashing down Fifteenth street at a full gallop just at dark. Officer Sanders thought he would stop them, but changed his mind when the plunging animals were within a few feet of rushing over him. The last that was heard of that team was a thundering noise in the direction of the Fifteenth street bridge, as the team started for Golden. A short time afterward two young men called upon Sanders, inquiring whether he had seen "a stray team."

"Stray team?" said Sandy, "I saw a span of sorrels again! like h—l towards Golden!"

The young men took the train for home early on Monday morning.—*Denver (Col.) Democrat.*

Correspondence.

We do not hold ourselves responsible for the opinions of our Correspondents. Our columns are open to free discussions on all Telegraphic subjects, without distinction of person or opinion.

No notice will be taken of anonymous communications.

An Electrical Conversation.

LONDON, ENGLAND, Dec. 5, 1874.

TO THE EDITOR OF THE TELEGRAPHER.

ONE of the most interesting events that has occurred in a long time—that is, from an electrician's point of view—was the "conversazione" given by Sir William Thomson, President of the Society of Telegraphic Engineers, on Thursday last, at King's College in the Strand, the affair being under the immediate management of Mr. G. E. Preece, the indefatigable secretary of the society. All the most recent electrical and telegraphic inventions were exhibited, and nearly, if not all of them, were set up in working order, with batteries, etc., complete. So many of these inventions were exhibited that I hardly know where to commence in describing them. I was much interested in watching the operation of an artificial submarine cable, composed of resistance coils and condensers, which exhibited precisely the same phenomena as an actual cable. The microscope galvanometer used for receiving the signals was arranged upon the mirror principle, but showing a black reflection on white ground. This is said to be more easily read, and to enable the receiving clerk to write his own message. This was exhibited by Mr. H. Varley.

Two automatic cylinder transmitters by Messrs. Siemens Brothers were "in circuit," to demonstrate the special functions of the transmitter and the working of the duplex system. The instrument unites two functions, composing and transmitting messages which are sent by pressing finger keys, each key forming its own letter, which is made by one pressure only, while it is received in "Morse" characters. The machine is in actual working upon a portion of the Indo-European system.

Specimens were shown under microscopes of various marine insects which attack submarine cables and work their way through gutta percha and hemp, and in some cases producing an actual "fault." At present telegraphists are open to suggestions for the destruction of these insidious destroyers. Poisoning has been suggested, but the experiment has not yet been tried, as far as I have heard.

Among the American inventions exhibited were the "electric gas torch" and "the electro-motograph," which are greater novelties on this side the Atlantic than in the United States, I fancy.

A type setting machine, by Mr. Mackie, attracted universal attention. It is a mechanical triumph, which has now been often described, and its capabilities seem only to stop short at making "copy." Its mechanism may be somewhat understood by saying that it has a slight resemblance to the capstan of a ship; that it has twenty-five pockets arranged around it at equal distances; that each pocket has eight divisions, holding eight kinds of type; and that the twenty pick-pockets, after having their triggers set at the "spelling bracket," by means of the perforated paper, run round and underneath the "pockets," and extract one or more letters at once, delivering them in due order at the spout, in endless lines, ready for justification. In the larger machines such a phrase as "and," "the," "man," "who," "which," etc., would be extracted from one pocket by one movement of a pick-pocket. The machine has been used for years by Messrs. Clay, Sons & Taylor, and is now setting the small advertisements of the *Hour*, the first line in minion and the remainder in nonpareil coming out the moment the attendant turns the handle or the steam is turned on.

A tide calculating instrument, a highly elaborated piece of mechanism, was exhibited by Sir W. Thomson, and the theory of its action is based upon the harmonious method of reduction carried out by Sir William, as reporter of the Tide Committee of the British Association, the whole of the calculations for which were reduced under the superintendence of Mr. E. Roberts, F.R.A.S. The main solar and lunar components and their several inequalities are registered in the form of an indicator diagram. When the machine is in action each solar hour is automatically notched in the diagram, so that tidal heights can be read off at any time in the day. The indicator paper is wound off on an endless reel, so that a whole year's curves can be traced on a single slip. Fitted on the same frame as this calculator was a tide gauge, with Sir William Thomson's improvements, which do away with the irregularities of printed paper, the instrument marking time and height. A large number of prominent electricians and scientific men were present, and the reunion was in every respect a most successful one. RECORDER.

Adjournment of Congress for the Holidays.— Scare at the Capitol.—New Fire Alarm Telegraph Needed.

WASHINGTON, D. C., Dec. 22.

TO THE EDITOR OF THE TELEGRAPHER.

The resolution to adjourn from to-morrow until Tuesday, January 5, passed the House of Representatives yesterday, and will no doubt be agreed to by the Senate to-day.

There has been no mention of telegraph matters in either House since my former letter, and no indication of interest therein.

Considerable excitement was occasioned one day last week in the House end of the Capitol by a rumor that the large stores of wood and coal in the vaults were on fire. A dense smoke of a peculiar odor filled the cellar, which gave color to the report. Upon investigation it was found that some person had incautiously lighted a gas burner, which had in some way got turned under the Western Union cables, which are suspended from the roof of the vaults, and the inflammable tar and hemp soon caught fire and burned rapidly, causing a dense smoke. The cable was rendered useless for telegraphic purposes by this accident, but the employes of the company soon substituted temporary wires for the cable, and there was but little interruption to business.

A local morning newspaper here published a sensational account of the burning of a *gas pipe* in the vaults of the House, and gave a vivid description of the rush of the flames toward the piles of wood and coal, and that its timely discovery by two of our citizens alone prevented great damage being done to the Capitol, etc.; all of which, of course, is bosh, as the foregoing is all there was of it, the burning cable being represented in the account by the supposititious gas pipe.

The necessity for the reconstruction of the fire alarm telegraph in this city has long been apparent, and there is at last some prospect of this important matter receiving attention. At a meeting of the Board of Fire Commissioners a few days since, a report was read from Mr. H. R. Miles, superintendent of the fire alarm telegraph, calling attention to the worn out condition of the line and apparatus comprising the system of fire alarm telegraph in his charge, from long continued use, and to the urgent necessity for immediate action, looking to the introduction of an entirely new system; and, in view of the facts fully explained in the document, he solicited the cooperation of the board in securing the passage of a proper bill by Congress during the present session for the construction of the most approved system of automatic fire alarm telegraph in the District. The report was accompanied by a bill to be presented to Congress, making an appropriation of \$50,000 from

the national treasury for the construction of the desired new system of fire alarm telegraph, the money to be expended by the District authorities, and an equal amount to be paid by the District of Columbia.

After fully discussing the report and the accompanying bill, it was finally ordered that they be transmitted to the District Commissioners, with the cordial endorsement of the Fire Board, and an earnest request that the District Commissioners recommend prompt and favorable action by Congress.

Mr. Miles also presented a communication announcing the death of Henry H. Bishop, who had been employed in the fire alarm telegraph office for nearly seven years; and, on motion of Mr. Thomas, it was ordered that Frank B. Squires be recommended to the District Commissioners for appointment to the position made vacant by the death of Mr. Bishop, and that Mr. G. H. Noyes be recommended to succeed Mr. Squires.

It is to be hoped that Congress will act promptly in this matter, as it is one of great importance to the city, whose fire alarm telegraph is liable to prove inoperative at a critical juncture. CAPITOL.

Electrical Puzzles Demanded.

TO THE EDITOR OF THE TELEGRAPHER.

I HAVE been a steady reader of your paper for years (having bought it every Saturday that I have had a nickel to spare and did not want a glass of beer). I have waded through all of Mr. Little's interminable explanations, sometimes commencing at the beginning and reading them through that way, and sometimes at the end, and worrying through 'em backwards; it doesn't matter much which. I have struggled with his duplex reviews, which, I confess, I was able to make nothing out of, even with the aid of a stereoscope.

Having, I say, done this, I feel perfectly competent to "tell you what you ought to do." The public, sir, demands puzzles! And it will be satisfied with nothing but puzzles!

What can be more elevating than to see a plug sit down, with a bran new pencil and a big pile of yellow soft sheets, to calculate the resistance of the Harlem bridge, or to solve some such problem as this: Given, a hairpin and a battery jar, make a self-breaking, double acting repeater, capable of connecting two lines, each a hundred miles in length.

Why not afford people this innocent pleasure? I think it would be a good plan for you to start a rebus column, like the "Fireside Weekly" or the "New York Companion." It would be far more interesting than those complicated sums in addition, with which you occasionally regale us under the mysterious heading of "assessments." You might, perhaps, offer as a prize a "shocking machine," warranted not to hurt a fly, or a register which you have to turn yourself with a crank.

If you don't adopt my suggestion I shall patronize some other paper, I warn you. V. I.

P. S.—If you really want to go into the puzzle business, why, I've about a dozen myself that I would dispose of for a consideration.

General and Recapitulatory.

IN THE WILDS OF JERSEY, Dec. 10th.

TO THE EDITOR OF THE TELEGRAPHER.

HAVING "written up" some operators of Jersey, we will now give a sort of recapitulation.

Since writing my last communication Mr. F. S. Gannon, chief train despatcher for the N. J. M. R'y, at Jersey City, has been triumphantly carried off by that young lady from Port Jervis and *duplexed*, and now they enjoy their double life at Hackensack. From appearances, we should say Frank made a very good selection, as also did she. Now, Mac and John, it's your turn—which speaks first?

Huntington, formerly manager of the A. & P. Telg. Co., of Jersey City, has resigned, to accept a position with the Am'n Dist. Telg. Co. in New York; while Huntington of Paterson has gone to New York, in the general office of the N. J. M. R'y.

Zabriske, at Wortendyke (whom the types made me say signed "Q" instead of "Z"), has been transferred from "S. Y." to "W. S." office, same place. Steve has gone to "W." to work nights in place of "Ed," who has gone to Midland Park "M. P." new office; and then there is Mac at "P. O.," who has got married since my last. Well, he no doubt deserves her. It must be catching.

"Co." and "G. S." still stick it out at "C. S." and "N. S.," while Jay M., at "D. G.," has his hands full in attending to tickets and telegraph, while Merriam reads his TELEGRAPHER weekly, and would rather go without his meals than his paper.

I will correct my account of the Erie Telg. Supt., Mr. Holmes. He is tall and slim, instead of short and stout, which applies to his assistant chief operator, Sampson. Jake, of "F. H." Paterson W. U. office, has left Billy and accepted the position of ticket agent and operator for the Erie R'y, at Newark.

On my rounds I missed making mention of a few, and hardly know if it is best now to do so, being afraid they might find out who "P's and Q's" is, and "go for" me, as "Q" wanted to for publishing his name.

I omitted Mr. J. Christopher, agent and operator at Ridgefield Park, N. J. M. R'y; also Mr. S. L. Holbrook, agent and operator at West End. He is the father of two or three sons who are telegraphers. The omission of these was unintentional on my part, and hope I am excusable in this case, as well as in that of one of the most prominent on the Midland, Mr. Jno. H. Bonds, div. clerk of the road at Jersey City, who has retired from the field of actual service to help our supt.

"J. C.," office of the Midland, has been moved from No. 24 Exchange Place to No. 20 of the same street and building, in the old office of Penna. R. R. Telegraph. It is a much more desirable location than that previously occupied. They expect soon another wire from this office to the general office at 96 Liberty st., N. Y., by looping on to No. 9 A. & P. wire.

Thanksgiving has come and gone, and I hope all enjoyed their turkey as well as did your correspondent.

Some who know say that P's and Q's "gives us away"—perhaps so. The adoption of the peculiar sig. was for two reasons; the first, that "Q" was forever trying to make me believe I made 6 for a P; the second and main reason, that our brother, whenever giving us advice, would be certain to say, "mind your P's and Q's."

We hope to hear from M. & E. Division of the D. L. & W. operators.

My next will be the N. J. & O. M. R. R. (southern division) operators. In future I shall try to do as I have tried to do in the past, to *mind my*

P's AND Q's.

P. S.—For fear of not thinking of it next time, I will wish all "A Merry Christmas and a Happy New Year." The same to our worthy editor.

Automatic Telegraphy and Legal Proceedings.

TO THE EDITOR OF THE TELEGRAPHER.

MY attention having been directed to a paragraph in your issue of the 19th inst., wherein it is stated that certain parties ask for an injunction on myself, as also on other parties, permit me to reply by saying that no injunction has been applied for, nor is it at all likely that such will be the case, for obvious reasons, well known to all concerned. GEORGE LITTLE,

December 23, 1874. Passaic City, New Jersey.

Daily Line Tests in England.

THE method of daily testing at the principal telegraph offices in England is as follows:

Each wire is first opened at the distant station for a stated time. The constant of a tangent galvanometer, *i. e.* its deflection with twenty cells through a resistance of 1,000 ohms, is noted, and then the copper pole of the line battery is put to the ground and zinc to line through the galvanometer, and the deflection noted. The tangent of the deflection first found is multiplied by the standard resistance and divided by the tangent of the reading when connected to the line; and this is again multiplied by the number of miles' length in the circuit tested. The product is the insulation per mile in ohms. The method used at some of the principal American offices is substantially the same.

Electric Lights for Lighthouses.

It is stated that the two lighthouses at the Lizard promontory, on the southern coast of England, at the entrance of the British Channel, are about to be fitted with the requisite apparatus for exhibiting the electric light. In experiments recently made near Paris, with an electric light specially adapted for illuminating distant objects, it was found that distance up to ten miles could be clearly brought out, and by means of telescopes every point in the cone of light could be reconnoitred. This was accomplished by a sort of gigantic lantern lens, the carbon points being placed within the tube supporting the lens. A light of this kind is, of course, not wanted in a lighthouse, but it would be of considerable value in disclosing to those on shore the position and condition of a vessel in distress.

Proposed Reform in the British Patent Laws.

WE see it stated that the Lord Chancellor of England has intimated his willingness to receive a deputation on the Patent Laws, and to consider the bill in which the proposed reforms are embodied. The chief points are reduction in the cost of the letters patent, a simplification in the manner of obtaining them, and amendments in the legal proceedings for repression of infringement. A general reform of the Patent Office and of the arrangements of the Patent Museum will also be proposed.

THE TELEGRAPHER

DEVOTED TO THE INTERESTS
OF THE
TELEGRAPHIC FRATERNITY.

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A JOURNAL OF ELECTRICAL PROGRESS,

DEVOTED TO THE INTERESTS
OF THE

Telegraphic Fraternity and the Advancement
of Electrical Science and the
Telegraphic Art.

Published Every Saturday,

AT

No. 38 VESEY STREET, New York.

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The Publisher, in announcing the **Eleventh Volume** of

THE TELEGRAPHER,

which will commence with the number for JANUARY 2, 1875, desires to return thanks for the LIBERAL SUPPORT which it has hitherto received, which it is expected and believed will be continued during the ensuing year.

All the popular and valuable features of the paper will be retained, and it will continue as heretofore to labor for the best interests of the TELEGRAPHIC FRATERNITY and the advancement of ELECTRICAL SCIENCE and the TELEGRAPHIC ART.

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To Correspondents of The Telegrapher.

IN consequence of Friday of this and next week being holidays, we are obliged to have THE TELEGRAPHER printed one day earlier for these two weeks than usual, in order to reach our subscribers at the regular time. Several communications intended for this week's paper are consequently unavoidably left over until next week.

Close of the Tenth Volume of The Telegrapher.

THE swiftly passing months have again brought round the close of the year, and with its expiring days the TENTH VOLUME of THE TELEGRAPHER is completed.

It is customary, in closing the record of the year and volume, for the Editor to improve the occasion by a few appropriate remarks, and although we do not know that there is anything which needs to be specially noticed at this time, yet we will not depart from the usual custom.

It will doubtless interest the friends and readers of THE TELEGRAPHER, to know that, notwithstanding the depressed condition of business generally during the past year, the paper has received an adequate support, and has been pecuniarily successful. As may be supposed from the price at which it is offered, it is by no means a mine of wealth to the publisher, but it occupies a position which no other telegraph journal has ever succeeded in attaining, of being supported entirely by the patronage received in the regular course of its business. During the year several other telegraph journals of more or less pretensions have been undertaken in different localities, all of which, with one exception, have already been interred in the journalistic graveyard in which annually so many similar ventures are entombed. Were the scurrilous exception also at the end of its career, it would be more creditable to all the parties concerned.

We have greeted these aspirants with kindly welcome as they have appeared, and have had no jealous feeling towards them, and regret that their publishers and editors should have realized so soon the difficulties which beset the path of journalism—especially class journalism. The same difficulties would undoubtedly have proved equally fatal to THE TELEGRAPHER in its earlier history had it not been sustained by the National Telegraphic Union, from whose treasury the deficiencies in its receipts were made good. For the past five years, however, it has been self-supporting, and we have no doubt will continue to be so in the future.

Of the success of the paper as a telegraphic and electrical journal it is perhaps hardly the proper thing for us to speak. We have, during the past as in previous years, received many assurances of satisfaction at and approval of its general tone and character, and words of commendation and cheer which have greatly encouraged us in the necessarily arduous task of

maintaining a journal of a high character, and one which should appropriately represent the telegraphic fraternity and the telegraphic interests. During the year we have received contributions to its columns from some of the most able and experienced telegraphers and electricians in the country, to whom we desire to express our thanks for their kind assistance, and solicit a continuance of their favors. The telegraphic fraternity generally have had the opportunity afforded them to discuss freely in its columns all matters of interest to them professionally. In no other publication can this opportunity be found, and it is one of the most valuable features of THE TELEGRAPHER, and one which shall be continued, at least so long as it shall continue under its present management and control. Free from any complication with any telegraph company, combination or clique, we are prepared to treat all telegraphic interests fairly and equitably, and always intend to do so.

It is not to be expected that THE TELEGRAPHER could succeed in pleasing all its constituents, especially when these are so numerous and so widely distributed. If there were none but words of praise we should be inclined to suspect that something must be wrong. We have been criticised and found fault with sufficiently to correct any overweening self-conceit that we might be disposed to indulge in. For sensible and honest criticism and fault finding we have the highest respect, and always endeavor to make such a means of improvement. The style of journalism which some of the telegraphic fraternity prefer is not of a character to elevate either the intelligence of the reader or the reputation of the journal. The history of BILL SMITH'S moustache, the impression that TOM JONES supposes he makes on his landlady's daughter, or the killing effect of JACK JONES'S new tile on his female acquaintances, etc., may be deeply interesting to some, but are of hardly sufficient importance to require much space to be devoted to them. Those who pine for that kind of mental pabulum must not look for it in the columns of THE TELEGRAPHER, or of any other journal which has a regard for its reputation or character.

During the volume which closes with this number we have endeavored to combine instruction in scientific and telegraphic matters with a complete record of telegraphic progress throughout the world, and such light and amusing articles as were available. That we have not wholly failed in our purpose to represent faithfully and creditably the telegraphers and telegraphic interests, we are assured by the continued support which we have received.

In conclusion, we desire to return our sincere thanks to the many friends who have stood by us during the closing year, by contributions to the columns of THE TELEGRAPHER and by material support in subscriptions and advertising patronage. We confidently anticipate the continuance of the favors of old friends and the accession of new ones during the year upon which we are about to enter. May it be indeed a Happy New Year to us all, and witness such a renewed and well founded prosperity to one and all as shall make it memorable in our future history—that it will witness a revival of telegraphic extension and progress we are already assured.

Active Telegraphic Competition Probable.

THE indications are that we are about to witness very active competition in telegraph business in the near future. The plans which had been adroitly laid for bringing the Atlantic and Pacific Telegraph Co. under Western Union control having been frustrated, both parties are preparing for an active and vigorous campaign. The advantages possessed by the Western Union Company in the great extent of its system, and its large revenues, will be conceded, but on the other hand, the companies competing with it are not so badly off as some may be inclined to suppose. The Atlantic and Pacific Company, by its perpetual lease of the Franklin Company's lines, has added permanently and largely to its facilities. It has no debt, and has been

for some time quietly absorbing lines of other and less important companies, and proposes in the coming year to build additional wires on new routes to still further extend and complete its facilities. When the Direct United States Cable is completed, it will have independent cable telegraphic communication with Europe, which, whether the cable itself shall prove to be a remunerative enterprise to its stockholders or not, will be an important advantage to the lines competing with the Western Union combination. We believe its business is conducted with economy—perhaps too economically in some respects. The Southern and Atlantic Company is completing its lines through to New Orleans, thus affording a good seaboard connection with the South, and the Dominion Telegraph Company gives a good connection with the Dominion of Canada. The danger of Government interference with telegraphic interests has kept matters comparatively quiet for the last two or three years, but this is apparently removed, for some time to come at least, and the elements are apparently all ripe for a renewal of active telegraphic competition. How this will affect the interests of the telegraphic fraternity is a question of much importance to the employés. We can hardly suppose that such a competition will affect them unfavorably, as it must increase the demand for telegraphic service.

We hope that this competition will be conducted sensibly, and that neither party will go into the euthrota policy of reducing rates below a compensating standard. Such a policy can benefit neither, and it should be remembered that it is always much easier to reduce rates than it is to restore them to a remunerative basis when once reduced.

President Orton's Report to the Directors of the Western Union Telegraph Company.

WE printed last week the report made by President ORTON to the Directors of the Western Union Telegraph Company, giving the results of the business of the company for the six months ending December 31st, partially estimated. This report is encouraging, showing, notwithstanding the reduction of tariff, an increase of receipts for the current year of about a quarter million of dollars, and a decrease of expenses of nearly \$600,000.

Mr. ORTON refers to the success of the "quadruplex," so far as it had been tested, as having been very satisfactory, and intimates a purpose, if it shall prove equally satisfactory on further tests, of recommending a still further reduction of tariffs, and anticipates the time when there shall be but four rates for telegraphic despatches on the lines of the company.

We are informed that since that report was written the quadruplex has been successfully operated between this city and Chicago on regular business. The title to the quadruplex instrument is in dispute, and if it shall prove to have been actually developed by the person who claims to have done it, there is likely to be somewhat protracted legal proceedings to determine its ownership.

The report will no doubt be read with interest by telegraphers generally, and, like all Mr. ORTON's official papers, is well written and interesting, not only to the stockholders and telegraphers but to the general public.

It gives us pleasure to know that the Western Union Company is prosperous and prospering, as it represents so largely the telegraphic interests of the country.

Comparative Cost of Telegraphic Systems.

ON the first page of this paper will be found a communication from Mr. F. L. POPE, in which interesting and suggestive figures are given upon the relative cost of the Morse, duplex and quadruplex, and the automatic telegraph systems. These figures have been carefully worked out and are believed to be substantially correct. If they do not make quite as good a showing

for the pecuniary advantages of the quadruplex as is sanguinely claimed by President ORTON, that is not the fault of the figures. It is very easy to make statements and assertions, but figures will tell the story much more accurately and reliably. We hope that this article will be carefully read by all telegraphers, and we will willingly publish their conclusions, or if it can be controverted, the columns of THE TELEGRAPHER are open to any person who may desire to controvert it.

Literature.

A descriptive account of a new system for the simultaneous transmission of telegrams in opposite directions upon the same telegraphic wire. By MARQUIS L. VIANISI. Translated from the French by EDWARD ROSENBUSCH, C. E.; M. S. T. E. Malta, 1874.

WE are indebted to Mr. ROSENBUSCH for a copy of the above pamphlet, which contains a full description of the VIANISI system of duplex telegraphy, with well executed lithographic drawings. The system described is on a principle which we do not remember of ever having seen applied for this purpose, the only special apparatus required being a peculiar key, and, of course, a rheostat for each station. The VIANISI system is said to be successfully at work between Naples and Rome, and is to be tested in submarine telegraphy at an early day. We may give an illustrated description of this system at an early day.

Carte des Communications Telegraphiques Internationales; dresse d'après des documents officiels par le bureau International des Administrations Telegraphiques. Berne, 1874.

The director at Berne has our thanks for a copy of this beautiful map, which is about four feet square, and shows at a glance all the overland and submarine telegraph routes in Europe, Asia and Africa. A small division in one corner gives the principal routes in every part of the world. The work is brought down to the latest dates, and is executed with rare beauty and fidelity. As a reference map for the electrical engineer or statistician it must prove of great value, to say nothing of its obvious value in the telegraphic offices of all countries.

Personals.

Mr. SAMUEL KELLY, lately of St. Paul, Minn., Northwestern Company's office, is taking report for the Western Union Company at St. Joseph, Mo.

Mr. GEO. McMAHON, recently of the St. Paul, Northwestern Company's office, has accepted the position of Night Manager W. U. Co.'s office, Kansas City, Mo.

The Telegraph.

The First Snow Storm of the Season.—City Telegraph Lines Demoralized.

THE first snow storm of the season in this vicinity occurred on Sunday last, and it was a very creditable opening of the winter season. The snow commenced falling at an early hour Sunday morning, and continued to fall steadily and heavily all day. There was, fortunately, little if any wind, but the wires and poles throughout the city became very heavily loaded with sleet and snow, and were prostrated in all directions. The Fire Alarm Telegraph was badly demoralized and became practically useless, the wires being down in all directions. The whole force of the Department was engaged in the work of restoring the wires, and by Monday night the main circuits were again in operation, but it will require several days to completely repair the damage. Fortunately no extensive conflagration took place during the interruption, and the precautions taken to notify the fire companies were sufficient for the purpose.

The hundreds of wires belonging to the several telegraph companies were also very badly damaged, the Western Union Company having only twelve wires in working order Sunday night. All the available force of the different companies was hard at work, and by Tuesday night the greater part of the damage was repaired. Some telegraph poles were broken by the weight of the snow and sleet, and by the strain caused by the broken wires.

The great number of wires which are required for telegraphic purposes in this city, and which are sus-

ended on poles and across the roofs of buildings in all directions, render such a storm as that of last Sunday exceedingly damaging and destructive. The wires are crossed in all directions, and many of those which are not broken are temporarily rendered useless from this cause.

Such an occurrence forcibly indicates the necessity for placing the wires under ground, where no storm can affect them. Unquestionably telegraph companies will eventually be compelled to adopt an underground telegraph system for large cities—the rapid extension and increase of telegraph business, and the constant adaptation of electricity to new uses in the way of communication, necessitating a corresponding and constant addition to the number of wires required.

The Southern and Atlantic Telegraph Company.

AT a meeting of the Board of Directors of the Southern and Atlantic Telegraph Company, held at the office of the Company, No. 51 New street, in this City, Wednesday, Dec. 16th. Mr. W. F. Herring, of Augusta, Georgia, was elected to fill a vacancy.

The following officers were also elected: Mr. Charles W. Blossom, President; Mr. Henry Hentz, Vice-President.

Mr. C. C. Blossom was appointed Secretary and Treasurer, and Mr. George H. Grace, General Superintendent.

Near Completion of the Southern and Atlantic Lines to New Orleans.

THE lines of the Southern and Atlantic Telegraph Company are completed through Mississippi to the Louisiana State line, and the construction of the remaining section of the line is being vigorously proceeded with. It is expected that within a few days the connection with New Orleans will be completed, and the line be in working order to that point.

The company has met with determined opposition in the extension of its lines, and every possible obstacle has been placed in its way, but it has overcome them all, and is about to realize the success for which it has been striving.

There has been no competition for telegraph business with the Western Union Company at New Orleans since the transfer of the Pacific and Atlantic wires to that company.

The United States Direct Cable.

UP to the time of writing this there is no news of the completion of the United States Direct Cable. The latest reports from the Faraday were up to Saturday, the 19th inst. She had then been engaged in taking up some forty miles of the cable between Torbay, N. S., and the buoy off the Newfoundland coast, and removing a slight fault which had been developed in that section of the cable. This done, about ninety knots additional of the cable had been laid from the place where it was originally buoyed off Newfoundland. The end was then buoyed, and the Faraday proceeded to the place where the other end of the cable was, buoyed, to make another attempt to lay the balance of the cable, and it is hoped soon to hear that, notwithstanding the lateness of the season, the work has been completed and the line in operation.

The Marine News Department of the Gold and Stock Telegraph Company.

THE Gold and Stock Telegraph Company has added to its business a marine news department, which is located in the basement of the Cotton Exchange in this city. This department is in charge of Mr. Thomas P. Scully, and arrangements are being completed for permanently establishing the business of marine news reporting in competition with the Merchants' Marine News Room.

There is in connection with this room quite a large telegraph office of the Western Union Telegraph Company, of which Mr. Robert M. Mattocks is manager. There are in this office eight instruments, and six operators are employed. The business of the Cotton Exchange is received and transmitted at this office, which in itself supplies a large amount of business to the line.

The Southern and Atlantic Telegraph Company also has an office in the Cotton Exchange, and is well patronized by the cotton brokers.

The New Sandy Hook Telegraph Line.

THE war between the city authorities of Bayonne, N. J., and the constructors of the new telegraph line to Sandy Hook, has finally been settled by removing the line from the streets and avenues in dispute. The new location follows the line of the abandoned Jersey City and Bergen dummy railroad, from Centreville

to the Latourette House dock at Bergen Point, where the line crosses to Staten Island by a submarine cable across the Kill von Kull.

Foreign Telegraphic Notes.

THE traffic receipts of the Eastern Telegraph Company for November, 1874, amounted to £33,060, as against £35,096 for the corresponding period of 1873; and those of the Eastern Extension Telegraph Company for the same month amounted to £17,728, as against £17,454 for the corresponding period of 1873.

The foundering of the steamer La Plata with a portion of the Brazilian cable on board will, it is stated, involve a total loss to the underwriters of £100,000. In the case of the Gomos, which was wrecked a short time since, the loss has, up to the present time, been only partially settled. The total liability will, it is reported, be about 35 per cent. of the whole sum insured.

The adjourned meeting of the Direct United States Cable Company, in London, Nov. 30th, was again adjourned until Dec. 14th. The shareholders were informed that the directors had no further communication to make with regard to the cable.

Telegraphic and Electrical Brevities.

THE Western Union are erecting large poles on Church and Dey streets, arranged to carry a great number of wires. The latter will be carried from the pole lines in the streets, over the buildings between Fulton Church and Dey street, to the new building which is now approaching completion.

The wires will enter the battery room, one story underneath the grand operating room, most of them coming in on the two rear sides of the building. The repairing of damages arising from the late great storm has temporarily put a stop to operations on the new work.

The Automatic Fire Alarm telegraph lines suffered but slightly during the recent severe storm. Mr. Fenn, the energetic superintendent, had everything working properly by noon on Monday. This speaks well for the construction of the lines under Mr. Fenn's charge.

The Telegraph in Switzerland.

THE *Journal Telegraphique* contains many interesting statistics with reference to the despatch of telegrams in Switzerland in 1872-3. It is shown, among other things, that 89.5 per cent. of all the telegrams sent reached their destination within an hour (as against 82.5 per cent. in 1872), and that the proportion of telegrams that arrived in thirty minutes and less, rose from 61.5 in 1872 to 68.5 in 1873, which shows a commendable degree of progress in good administration.

Matched.

THE following from the *Dallas (Texas) Daily Herald*, will interest the telegraphic friends of the parties.

"NEW ORLEANS, Dec. 9th, 1874.

"Captain George R. Eitemiller, well known as a Texas ranger and celebrated athlete and tumbler, arrived in this city last night. He is matched with P. Boliver Ayers. He is doubly welcome, from the fact that his genius as an electrician and practical operator in the employ of the Western Union Telegraph Company is unexcelled."

Quotations of Telegraph Stocks at N. Y. Stock Exchange,

Showing Lowest and Highest Prices each day during week.

Dec.	WESTERN UNION.		ATL. AND PAC.		AMER. DIST.		GOLD AND STOCK.	
	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.	Bid.	Asked.
17	82½	82¾	17	19¾	39	41	62	75
18	81½	82½	17	19¾	39	41	62	75
19	81½	82½	19	19¾	39	40	62	75
21	80½	81½	19	19¾	39	40	62	75
22	79¾	80¾	18½	19½	39	39¾	62	75

FACTS should invariably be acquired from actual observation. It is not alone sufficient to read of a fresh fact in a book. An effort should be made to see the fact for itself. Books merely direct search, but we should never be satisfied with mere reading.—W. H. Preece.

New Patents.

OFFICIAL COPIES of any U. S. Patent issued since July 1st 1871, including drawings, specifications and claims in full, sent free to any address for 25 cents each. Address F. L. POPE, P. O. Box 5508, New York City.

For the week ended November 17, 1874, and bearing that date. 156,897.—ELECTRIC TELEGRAPH APPARATUS. William Thomson. Glasgow, Great Britain. Filed Jan. 6, 1872.

Suspended Signal coil, controlling siphon ink recorder, has each side in a magnetic field. Graduated shunts are applied thereto. The coil and its core, stiffened in one plane by stays, and provided with counterpoise to lessen irregular vibrations, are suspended from a removable plate. Ink or other fluid is forced through siphon to clean it by hydrostatic pressure. Paper kept moving slowly when no signals are being received, to prevent accumulation of ink at end of siphon. Apparatus driven by an electro-motor, whose speed can be regulated by shunts or resistances. Shunts are controlled by a differential movement, regulated by a pendulum. Speed of paper regulated by electric chronometer, time being marked on paper by a punch on the wheel work. An electrified inductor is connected to siphon by a thread of small conducting power, whose length increases or diminishes resistance to passage of current.

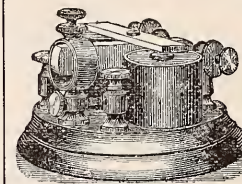
1. The combination and arrangement, substantially as before set forth, of the electro-magnet, the suspended signal coil, and the fixed soft iron core for said coil.
2. The combination, substantially as before set forth, of the suspended signal coil, the suspended siphon or marking tube, and the connecting fibre, with a removable plate or stock, so that the said coil and marking tube can be readily removed and replaced by others adjusted for use.
3. The combination, substantially as before set forth, of the signal coil with the stretched wires communicated with the insulated terminals, the drum to shorten or lengthen the said wires, and a torsion head to turn the same on their axes, so that the signal coil may be adjusted by the torsional elasticity of the stretched wires, which also act as electrodes.
4. The combination, substantially as before set forth, of the marking tube, of the stretched wire that carries it, and the torsion head for turning the said wire.
5. The combination, substantially as before set forth, of the ink reservoir, of the marking tube, and the suspended signal coil, so that, while the said marking tube is fixed to the ink reservoir, the outer end of said tube is free to be moved in consonance with the oscillations of the signal coil.
6. The combination, substantially as before set forth, of the ink reservoir and the device for applying a varying pressure to the surface of the liquid in said reservoir, so that said liquid may be drawn or forced through said tube as desired.
7. The combination, substantially as before set forth, of the working arm of the marking tube with a stay for stiffening it.
8. The combination, substantially as before set forth, of the marking tube with a counterpoise to diminish vibrations.
9. The method, as before set forth, of preventing an accumulation of ink at the point of the marking tube when signals are not being received, by traversing the paper slowly past the said point at such times.
10. The combination, substantially as before set forth, of the plate connected with the earth, the insulated plate, the contact springs, the revolving carriers, and the siphon or marking tube.
11. The combination, substantially as before set forth, of the motor and the paper drawing gear by hanging pulleys, so as to diminish vibrations.
12. The combination, substantially as before set forth, of the paper drawing rollers with a pendulum, so as to control the speed of the former.
13. The combination and arrangement, substantially as before set forth, of the paper moving mechanism, the chronometer mechanism, and the types of the latter, so that the time is recorded upon the signal receiving paper.
14. The combination, substantially as before set forth, of the electrified conductor with the siphon or marking tube by an adjustable inductor of very high resistance, whereby any excess of electricity may be drained off.
15. The combination, substantially as before set forth, of the suspended signal coil, the magnet, the inductor, and a dry pile to initiate the electrification of the inductor.
16. The arrangement, in the same machine, of a single motor with the suspended signal coil, the siphon or marking tube, the mechanism for moving the receiving paper, and the mechanism for moving the punched paper, so that the same motive power which produces the electric sparks is employed to move forward the receiving paper and the punched paper for sending signals.
17. The relative arrangement, substantially as before set forth, of the suspended signal coil, the siphon or marking tube, the signal transmitting mechanism, and the paper moving mechanism, so that the same strip of paper may be employed both to receive and to transmit the signals.
18. The relative arrangement, substantially as before set forth, of the suspended signal coil, the siphon or marking tube, the signal transmitting mechanism, the paper moving mechanism, and the switch and shunt, so that the same paper may be employed to record both signals transmitted and signals received.
19. The combination and arrangement, substantially as before set forth, of the suspended signal coil, the siphon or marking tube, the inductor, the two constant springs for giving positive and negative signals, and the switch, so that, in a machine producing marks by the operation of a suspended coil, positive and negative signals may be given by two contact springs only.

Born.

DUGGAN.—To Mr. J. C. DUGGAN, of the Charleston, S. C., Southern and Atlantic Telegraph office, Dec. 16, 1874, a boy, 12½ pounds.

WILLIAM BROWNLEE,
Dealer in
CEDAR TELEGRAPH POLES
OFFICE FOOT OF SHELBY STREET,
DETROIT, MICHIGAN.

PHILADELPHIA.
L. G. TILLOTSON & CO.
beg to announce the opening of an establishment for the sale of
TELEGRAPHIC AND ELECTRICAL GOODS
of every description, at
No. 54 SOUTH FOURTH STREET,
(Corner Chestnut street,) PHILADELPHIA.
They solicit the patronage of their friends and the telegraphic fraternity generally.



ECONOMIZE!

Procure the best and cheapest Telegraph and Electrical Instruments and supplies of all kinds from,
LANNERT & DECKER,
31½ Prospect St., Cleveland, O.
Send for circular.



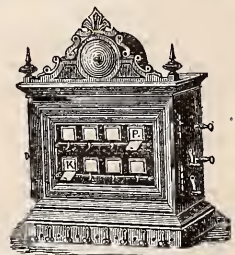
LECLANCHE BATTERIES.

IMPORTANT NOTICE.

After JANUARY 1st, 1875, we will allow TWENTY CENTS for each used-up Porous Cell of this Battery that are returned to us free of charge, in good order. A change is made in the discount to the trade. A list will be furnished on application to

THE LECLANCHE BATTERY COMPANY,
No. 40 WEST EIGHTEENTH STREET;
or to
L. G. TILLOTSON & CO.,
8 Dey street, sole Agents.

CHAMPION BURGLAR ALARM AND ANNUNCIATOR COMPANY
40 WEST 18th STREET, NEW YORK.



We invite TELEGRAPH MANAGERS AND OPERATORS throughout the country to act as our agents for the introduction of our superior BURGLAR ALARMS AND ANNUNCIATORS into private houses, hotels, banks, &c. Upon receipt of plans of houses we will send skillful mechanics to estimate upon work, or will give any information in writing that may be required, *Liberal commissions will be paid upon any orders that may be secured for us.* Our Alarms and Annunciators have just been awarded the FIRST PREMIUM of the American Institute.

Explanatory Circulars will be furnished upon application to the Secretary.

L. G. TILLOTSON, President.
CORNELIUS ROOSEVELT, Secretary and Treasurer,
40 West 18th Street, New York.

THE Rev. Dr. Sunderland, chaplain of the U. S. Senate, prayed "that God would make this Congress as the Sanhedrim to the Jew," but the telegraph reported it as the "Sacred Ram to the Jew."

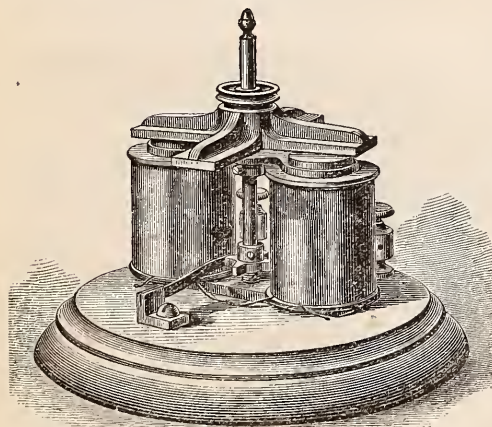
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- KEYS, various styles, including the SCHNEIDER KEY, just out, no legs, wire connections above the table.
- REGISTERS, with SPRINGS of WEIGHT.
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Run by Electricity!

It will work well with an ordinary local battery.

Price, with two cells Eagles' Metallic Battery \$6 00
" without Battery 4 00

May be seen working at the office of the THE TELEGRAPHER.

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The Electro-Magnetic Manufacturing Company,

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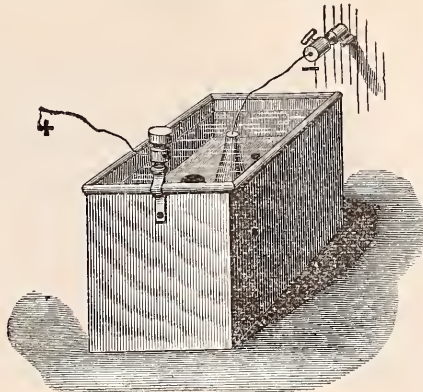
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Durability, Efficiency, and Economy of Expense and Labor at last Secured.

THE EAGLES METALLIC BATTERY.

PATENT APPLIED FOR.

The undersigned having secured the exclusive Agency for manufacture and sale of the

EAGLES METALLIC BATTERY,

now offer them to the public as the best Battery for Telegraphic and other purposes yet devised.

The Battery cell is made of lead, and forms one pole of the battery. Sulphate of copper is the only chemical required to be used.

These Batteries have been fully tested during the last year, although only recently offered for sale, and have proved to be superior to any other as regards efficiency, economy and durability. When once set up they require no attention for from four to six months, according to the service required of them.

Two sizes are made at present, but others will soon be ready. No. 1 is a large square cell, and can be used as a local or for running motors. Price, \$2.25.

On Locals, one No. 1 cell is used in place of two Daniells, at a saving of nearly one half in cost.

No. 2 is a round cell, designed for main line. Price, \$2.

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COPPER FOR CONDUCTIVITY.—STEEL FOR STRENGTH.

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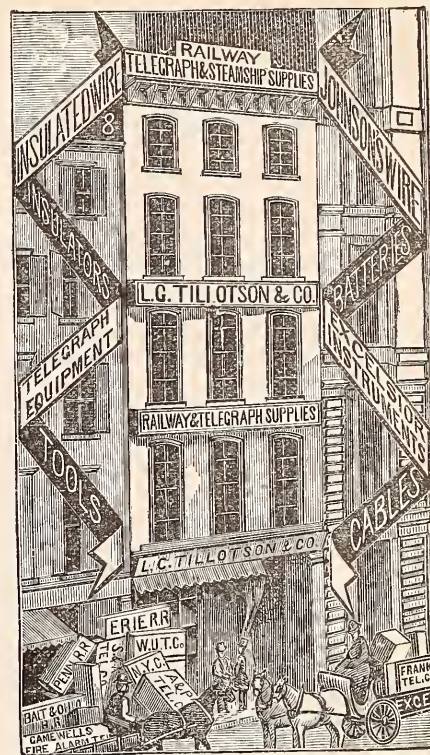
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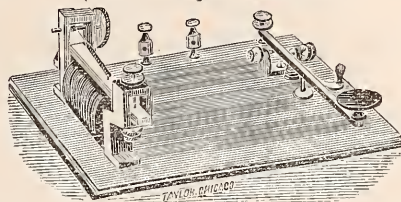
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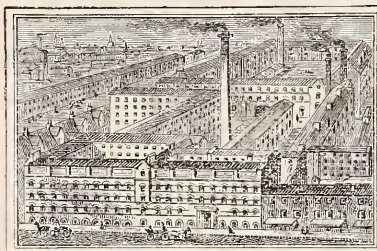


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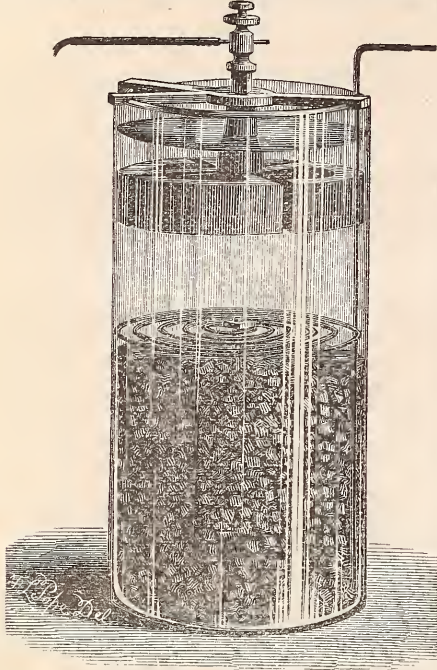
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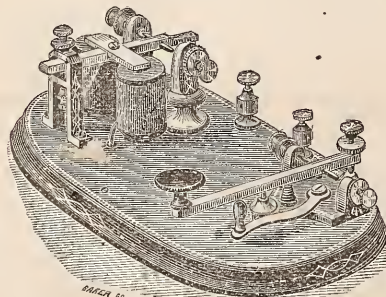
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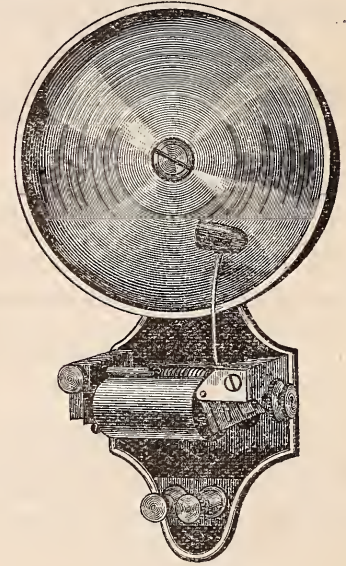
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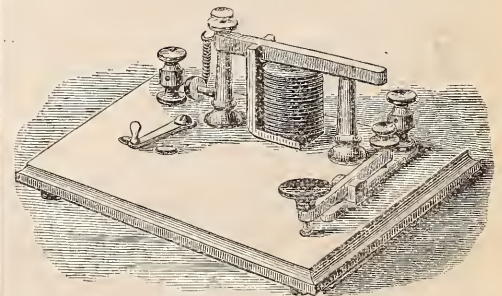
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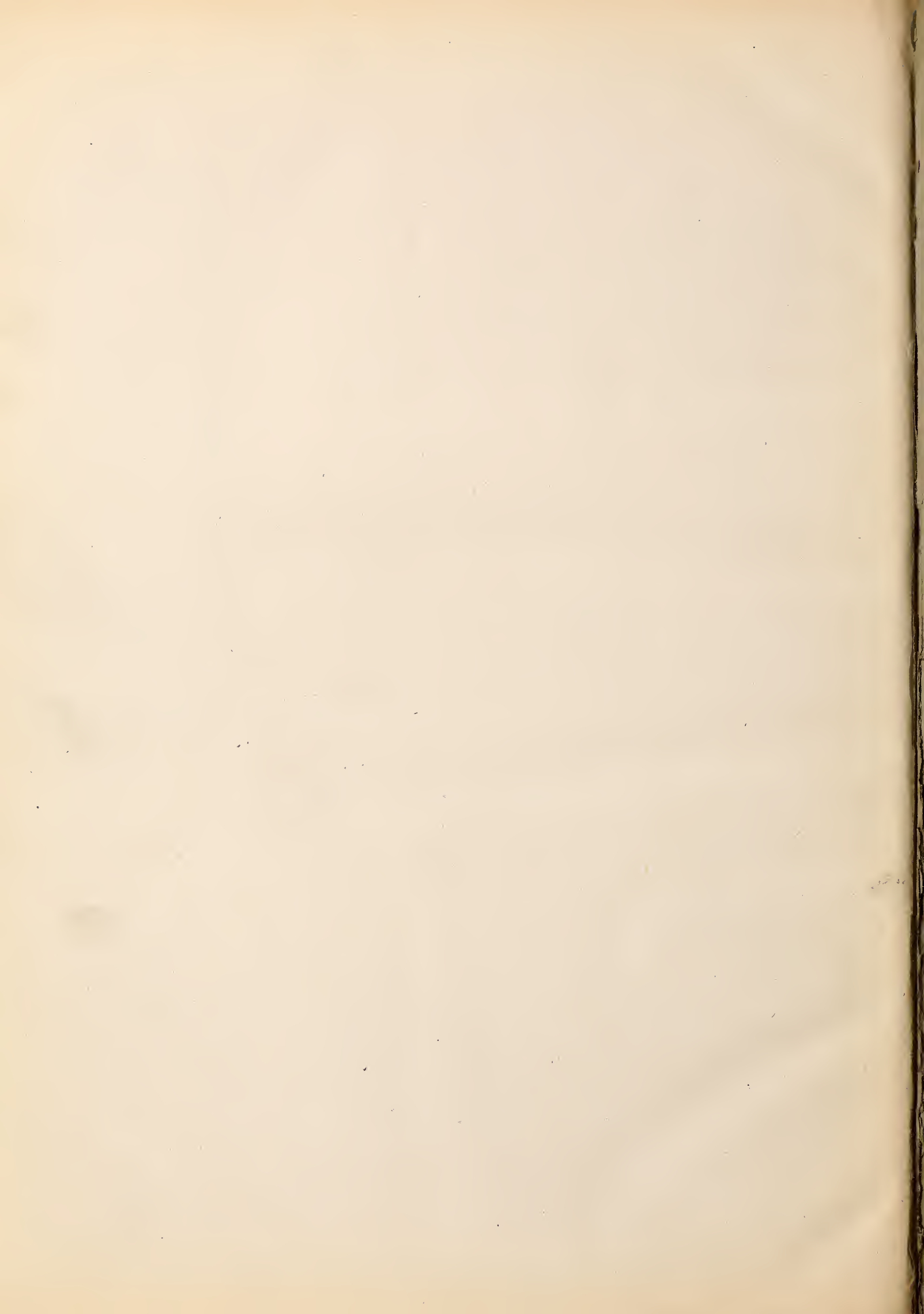
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