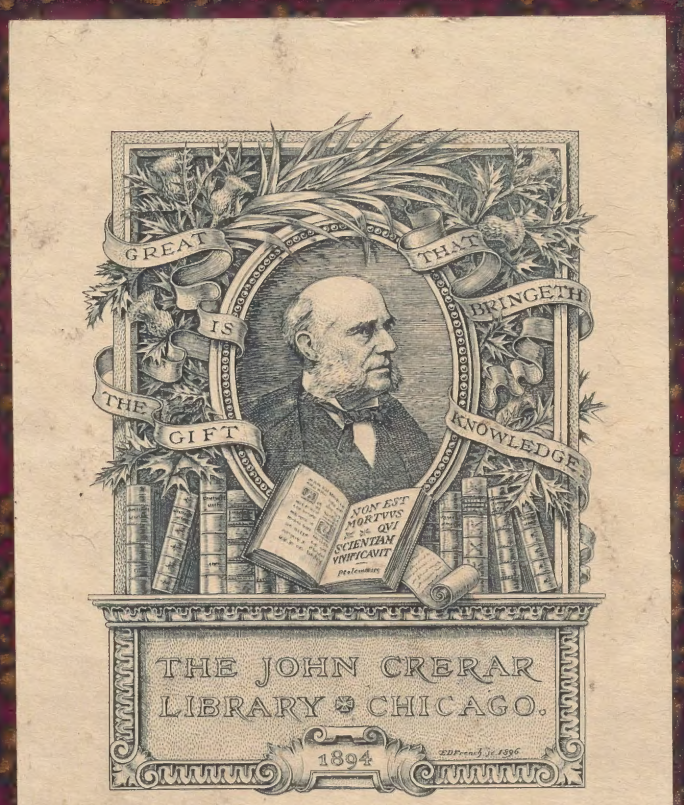
GREAT IS THE GIFT THAT BRINGETH KNOWLEDGE
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1894

THE

ELECTRIC AGE

DEVOTED TO TELEGRAPHY, TELEPHONY, ELECTRIC LIGHTING AND ALL PHASES OF ELECTRIC DEVELOPMENT.

VII—No. 14. NEW YORK, DECEMBER 16, 1889. $1.50 per annum. Single Copies 10 cents.

THE BEGINNING OF THE END.

Edison Company Sustained. Westinghouse Company Defeated.

Sawyer-Man Patent Decided by the Court to be a Fraud and Absolutely Valueless.

Extracts from the Decision of Justice Bradley, Oct. 5, 1889.

Circuit Court of the United States for the Western District of Pennsylvania.

THE CONSOLIDATED ELECTRIC LIGHT COMPANY
(WESTINGHOUSE COMPANY)
versus
McKEESPORT LIGHT COMPANY
(EDISON COMPANY).

No. 5, May Term 1888.
On Bill and Final Hearing.

EXTRACTS FROM OPINION OF THE COURT.

"The great question in this suit is whether the patent sued on is valid, so far as involves a general claim for the use in electric lamps of incandescing carbon conductors made of fibrous or textile substances. If it is, the complainant must prevail. If it is not, the bill must be dismissed".....

"Is the patent valid for such a broad claim? The defendants contend that it is not; first, because no such invention was set forth in the original application, but was introduced more than four years after it was filed, and after the same material had been used by Edison, and claimed by him in application for a patent; secondly, because Edison, and not Sawyer-Man, was really the original and first inventor of an incandescent conductor made of fibrous or textile material for an electric lamp."....

"It is very clear to us that in the original application for the patent sued on the applicants had no such object in view as that of claiming all carbon made from fibrous and textile substances as a conductor for an incandescing electric lamp. Nothing on which to base any such claim is disclosed in the original application. We have carefully compared it with the amended application, on which the patent was issued, and are fully satisfied that after Edison's inventions on this subject had been published to the world there was an entire change of base on the part of Sawyer & Man, and that the application was amended to give it an entirely different direction and purpose from what it had in its original form."....

"By an adroit amendment made in 1885, they say: 'Our improvement relates more especially to the incandescing conductor, its substance, its form and its combination with the other elements composing the lamp.' The purpose of this amendment is obvious, and needs no comment."....

"The fact is that Sawyer & Man were unconscious that the arc was not new, and supposed that they could get a patent for it; but, as their eyes were opened, they changed about and amended their application, and made the material of the conductor the great object—carbon made from fibrous or textile material. Compare the original with the amended application, as first stated in this opinion, and this purpose most obviously appears."....

"The fact that the whole object of the application was changed is evinced by the correspondence of the parties."....

"This testimony of Mr. Broadnax, which is undoubtedly to be relied on, in connection with the letter just quoted, shows that the idea of claiming carbons made from fibrous and textile materials was an afterthought, and was no part of the purpose of the original application. The amendments relating to this new and broad claim were made afterward, in February and March, 1885."....

"We are of the opinion that the changes made in the application in this regard were not justifiable, and that the claim in question cannot be sustained."....

"We are not at all satisfied that **Sawyer and Man** ever made and reduced to practical operation any such invention as is set forth and claimed in the patent in suit. Their principal experiments were made in 1878, and perhaps the beginning of 1879. The evidence as to what they accomplished in the construction of electric lamps is so contradictory and suspicious that we can with difficulty give credence to the conclusions sought to be drawn from it. **We are not satisfied that they ever produced an electric lamp with a burner of carbon made from fibrous material, or any other material, which was a success."**....

"The application for the patent in suit was not made until January, 1880, nearly or quite a year after all their experiments had ceased, and after the inventions of Edison had been published to the world."....

"The explanations made by the complainants for the delay in applying for the patent in suit fail to satisfy our minds that Sawyer & Man, or their assignees for them, have not sought to obtain a patent to which they were not legitimately entitled."....

"But, suppose it to be true, as the supposed inventors and some of the other witnesses testify, that they did in 1878 construct some lamps with burners of carbon made of fibrous material, and of an arched shape, which continued to give light for days or weeks or months; still, were they a successful invention? Would any one purchase or touch them now? Did they not lack an essential ingredient which was necessary to their adoption and use? Did they go any farther in principle, if they did in degree, than did other lamps which had been constructed before? It seems to us that they were following a wrong principle—the principle of small resistance in an incandescing conductor, and a strong current of electricity—and that **the great discovery in the art was that of adopting high resistance in the conductor with a small illuminating surface, and a corresponding diminution in the strength of the current. This was accomplished by Edison in his filamental thread-like conductors, rendered practicable by the perfection of the vacuum in the globe of the lamp.** He abandoned the old method of making the globe in separate pieces, cemented together, and adopted a globe of one entire piece of glass, into which he introduced small platinum conductors, fastened by fusion of the glass around them, thus being able to procure and maintain perhaps the most perfect vacuum known in the arts. In such a vacuum the slender filaments of carbon, attenuated to the last degree of fineness, may be maintained in a state of incandescence without deterioration for an indefinite time, and with a small expenditure of electric force. **This was really the grand discovery in the art of electric-lighting, without which it could not have become a practical art for the purposes of general use in houses and cities."**....

"The principle and great thing described is the attenuated filament and its enclosure in a perfect vacuum."....

"We think we are not mistaken in saying that but for this discovery electric lighting would never have become a fact. We have supposed it to be the discovery of Edison because he has a patent for it. This may not be the case. It may be the discovery of some other person; but, whoever discovered it, it is undoubtedly the great discovery in the art of practical lighting by electricity."....

"THE BILL MUST BE DISMISSED."

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NEW YORK, DECEMBER 16, 1889.

To accomodate our rapidly growing business, we are compelled with this issue to enlarge the size of the paper. It is not quite as good a time to adopt this radical change as the beginning of a new volume, but our readers will, no doubt, agree with us that it is preferable to keep abreast of the times no matter how extensive the changes may be or how often they occur, so long as the readers are the gainers by that change. The electrical procession is a rapidly moving one, and it is an absolute necessity for us to keep up with the onward march. From this time on we will be enabled to present to our readers more matter occupying less pages of space than heretofore. It is a move in the right direction, and one, we hope, will be appreciated by all our friends.

More attention should be given to the proper wiring of buildings, which are too often allowed to pass without particular notice. The wiring is more important than the selection of a dynamo, for the reason that a defective machine can be replaced with a good one, but poor wiring cannot be remedied without entailing considerable damage, providing the faults are discovered before actual destruction of property has occurred. No wonder the public is complaining. It has good reason for fault-finding, and no one is better aware of this fact than the manufacturers of dynamos themselves. Cheap wiring is dear at any price.

According to a German return, the number of electric railways in Europe at the end of last year was eleven, of which the oldest, the Lichterfelde-Berlin Railway, was opened in 1881, being one and one-half miles in length, with one motor and car, and carrying yearly 100,000 passengers. The latest is that opened in Brussels last year, with five motors and cars.

If Mr. Edison's new battery will do all that is claimed for it, the company controlling the patents will find its hands pretty well occupied filling orders for some time to come. The efficiency of the battery challenges admiration. In another column will be found a description of this cell, giving figures, which are interesting from any standpoint.

A decree has been given in the United States District Court, ordering the foreclosure of the mortgage of the American Rapid Telegraph Company.

A San Francisco family used a phonograph to cheer their mother's illness, and also to preserve the tones of her voice after death.

THE ANGLO-AMERICAN CABLE.—The Anglo-American Cable Co. will open an independent office at No. 8 Broad Street, January 1st. Mr. G. H. Carson, of London, has been in this country for some time and has satisfied himself that the Company can transact a larger business if it were to maintain an office independent of the "pool," which it is permitted to do by the articles of the pooling compact entered into some years ago. All the cables being lodged at the central cable office, 16 Broad Street, made it difficult for each particular company to "hustle" for business as it would like to. In London, each company of the pool maintains its own office, and quite a rivalry exists among them to secure the lion's share of the business. It is contemplated to bring about the same state of affairs in this country. Mr. Montford, one of the enterprising London managers, has been transferred to this city to look after the bnsiness of the Anglo. Many telegraph people look upon this move as indicating dissatisfaction over the manner in which the Western Union Company has permitted oppositions to derive more than their share of the cable patronage, by making no effort whatever to canvass for the business.

Mr. P. B. Delany, in his paper read before the American Institute of Electric Engineers, New York, Nov. 19th, reads a very valuable lesson to the railroad companies, who overlook the fact that the telegraph is the foundation of all railroad systems. He very truthfully states that "money has been lavishly spent on sleepers, buffets and parlor cars, and all kinds of luxurious upholstery and conveniences, to attract the traveller by rail, while the rail itself, the safety of the car, train and passengers, have been made to depend on the ability of some overworked boy at some far-off way station to resist sleep, at a time when he ought to be snugly tucked up in bed. If the travelling public could look more discriminatingly at the electrical equipment of railroads and take less account of tapestry and tinsel, they would in many thousands of cases, I am sure, change their line." It would be far better policy to have competent telegraph superintendents and a fully equipped electrical service on all roads, which would certainly insure more perfect safety to the rapidly increasing travel. Mr. Delany deserves great credit for his determined stand on this important subject.

What is said to be the largest organ in the world is building at the Roosevelt Organ Works, in this city, for the Auditorium Building, Chicago. It will be operated by electricity. Electric motors are now used for pumping the organ in eight churches in New York City at a cost of $10 per month per horse power. The water motor consumed too much water, and the gas engine was too noisy.

The first electric standard railway in the world is to be built between Atlanta and Savannah, if we can depend upon Atlanta newspapers. The water power of the Ocmulgee and other rivers along the route is to generate the electricity to move the trains, and it is estimated that 65,000 horse-power will be within the reach of the road.

The Central Station companies of the State of Maryland and the District of Columbia have organized a State electric association. Mr. A. R. Foote, chairman of the committee on State and municipal legislation is urging forward the work.

The National Electric Light Association is out for free trade as far as copper is concerned. It desires the abolition of the duty on copper, and a committee consisting of C. A. Brown, G. M. Phelps and J. F. Morrison is urging matters.

A new electric headlight for locomotives, with but one carbon, is in successful use on the Terre Haute and Indianapolis Railroad.

Telephone ethics are banishing the familiar word "hello!" though conservative subscribers continue to employ it.

EDISON'S PATENT SUSTAINED.—The Minister of Agriculture, at Ottawa, Ont., has rendered a decision dismissing the petition of the Royal Electric Company of Canada, for the cancellation of the patent for the Edison incandescent lamp owned by the Edison Electric Light Company. Richard Pope, Deputy Commissioner of Patents, rendered a decision in the same petition, in February last, annulling the Edison patent. Doubt having arisen as to the jurisdiction of Mr. Pope, a rehearing of the case took place before the Hon. Mr. Carling and Sir John Thompson, with the result that the Edison Electric Company was sustained in its patent.

RUMORED SALE OF TELEGRAPH PLANT.—A dispatch from New Haven, published on December 7th, stated that Elliot F. Shepard and other New York newspaper men had bought the Empire and Bay State Telegraph Company, running from New York to Boston, and will convert it into a press association. An investigation by us reveals the fact, that nothing of the kind is contemplated. Mr. Shepard is a member of the Associated Press, and not likely to enter into a press scheme of this character. The wires referred to, however, could undoubtedly be purchased for a mere song by any one desiring Boston circuits.

On the 9th instant another man was killed by electricity under circumstances very similar to those attending the death of lineman Feeks a few weeks ago. The last death, however, was the fault of no one but the victim himself. Had he taken ordinary precautions he might have been still alive. In this case, as in preceding ones, the electric light companies received the usual amount of blame and denunciation from that portion of the community which seem to have the idea that electric light companies are maintained for the purpose of killing people and oppressing humanity.

In a case of this sort fault is easily found by these people with the companies, but in their sober, second thought, they cannot fail to recognize the fact that there are two sides to every question. Give the companies a fair chance. The authorities of the state or city will get things regulated in due time. It takes experience in electric lighting as well as in everything else to reach perfection, and the electric light companies will "get there" if they will only be allowed to. The plane on which the world stands to-day in its progress towards perfection has been reached only by trial, death and disaster; but in the end all will be well.

We are glad to note that there is a prospect of the military telegraphers receiving some official recognition by the government. Their cause is championed by Senator Morrill of Vermont. It is due to these loyal men that the branch of the service under which they served during the war should be given some definite status in the army, of which it was a part. Theirs was a duty of vital importance in carrying out the plans of the campaign, and their services should have received due official recognition long ago. We hope they will adhere to their laudable purpose until Congress grants them what they are after.

The Pond Engineering Company has furnished the American Electric Light Company of Kansas City a 50-horse power Armington & Sims engine, and the Empire Cordage Company of Champaign, Ill., a 15-horse power Gardner vertical engine for driving its isolated Edison plant. The company will furnish and erect two 150 horse power boilers complete, with Pond Engineering Company setting, for the S[illegible] Louis Smelting and Refining Works.

IGOE AND OGLE.—Well may telegraphers [illegible] their hearts swell with pride when their [illegible] are mentioned. Igoe, the man; O[illegible] woman. Both operators; both marty[illegible] As long as operators receive their [illegible] the names of Ogle and Igoe be en[illegible]
Cincinnati Enquirer.

TELEGRAPH LINE ADJUSTMENT.*

BY P. B. DELANY.

I take pleasure in bringing before you this evening an improvement in telegraphy, which, although of recent discovery, has already been proved to be practical and beneficial in its operation. I have called it "The Line Adjusting System." This title is not strictly correct; but it is the most comprehensive one I could think of. The system keeps relays at intermediate stations in a telegraph circuit in adjustment in bad weather.

In this country we call a partial loss of current to the earth "escape" to distinguish that condition from a "ground," which means total loss. The terms "light escape," "heavy escape" and "ground" express the different degrees of depletion of a telegraph wire of its current. Demoralization in the operation of telegraphs is proportioned relatively to each degree. No one who is not, or has not been, a telegrapher can appreciate the trouble and turmoil which a rainy day brings to a telegraph wire, especially to a way wire, such, for instance, as the dispatching wire of a railway on which there are usually a large number of intermediate offices. Light escape means trouble, but heavy escape means chaos. Improvement in insulation has done much toward remedying the difficulty, but perfect insulation cannot be obtained, nor would it be altogether desirable, for then the wire could not in all cases be worked at as high a speed as with the present faulty insulation. What is needed is an insulation constant in its imperfection. So long as bare wires are strung on poles, and rain and sunshine succeed each other, there will be a fluctuating condition of insulation, and consequently an ever changing current on the line, and, as a matter of course, corresponding changes in the attraction of the relay magnet for its armature. These changes in the magnetic pull necessitate readjustments of the retractile spring, the tension of which must always be regulated so as to allow the armature to move quickly between its limits, in response to the make and break of the circuit at the operator's key at any station on the line.

It does not follow, however, that a loss of current through bad insulation means a weakening of the electro-magnetism in all the relays. This is generally the effect near the middle of the line, provided the escape is about equal on either side, but at stations near the ends of the line, where the main batteries are located, a heavy escape means a reduction of resistance of the circuit by the partial ground established beyond them, so that they get the force of the main battery from the terminal near them over a comparatively short circuit. Under such conditions the stations near the ends of the line can work with the near terminal, and stations between with a very low tension on the retractile spring, while it would be impossible for them to receive signals from the distant terminal, or offices beyond the middle of the line, on the same adjustment. A much higher tension must be put on the spring. On a line having an evenly distributed escape throughout, offices near the middle should not have as much difficulty in adjusting as offices near the ends, provided, of course, that the escape is not so heavy as to leave them insufficient current to work with. It frequently happens, however, that a storm extends only over half the line. Under this condition all the offices on the clear end of the line work with each other on a low adjustment, but require a high adjustment to hear the offices on the storm bound end of the wire. Operators naturally prefer a low adjustment to a high one. When they are sending, their relay armatures

* Read before the American Institute of Electrical Engineers, May 21st, 1889.

and sounder levers respond promptly to the manipulation of the keys, making the work much easier. With a high adjustment the drag of the sounder click behind the movement of the key renders the manipulation laborious. Hence it is, that an operator who has

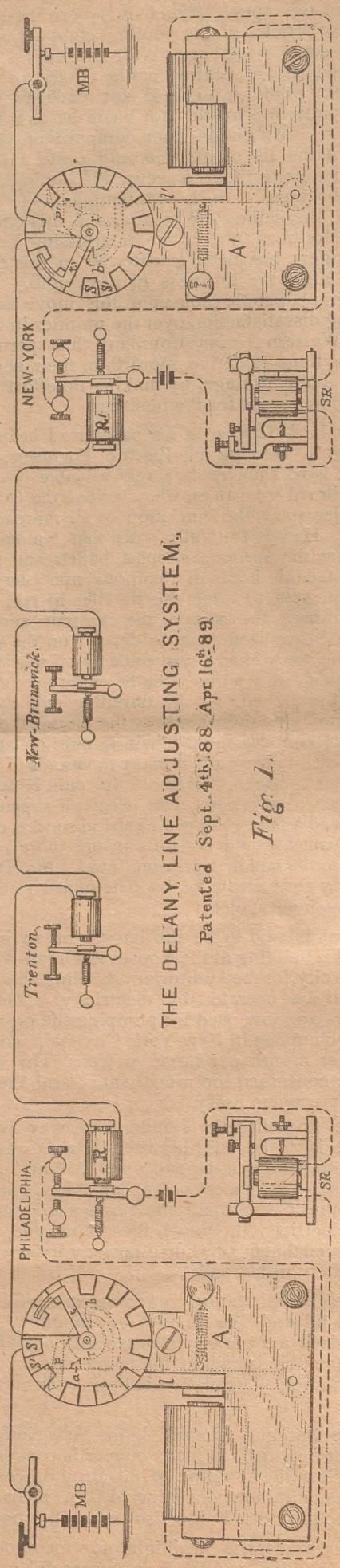


Fig. 1.

at one minute been receiving from a distant station, requiring high adjustment, will, when he comes to send a return message, turn down his adjustment, so the sounder will follow his key smoothly. Then if the distant station finds it necessary to stop him, he does not feel the break, but goes right on sending.

I have noticed that nearly all operators, good and bad, are vain of their abilities to send rapidly, and nearly all are ambitious to send faster than the operator at the receiving station can write it down, or in other words to "rush" him. This is especially true of young operators, but taking them collectively I do not think there is a body of craftsmen in existence who work so willingly as telegraphers. Each seems individually impelled to "salt" the man at the other end of the line, if possible, and when he succeeds in making him "break," he mentally records a victory and goes at it again with renewed vigor. To outsiders this self-imposed rapid pace may seem foolish, but to the knight of the key there is great glory in it. The great artist never lived, actor, orator or musician, whose soul was more thrilled at the plaudits of thousands, than is the soul of the expert telegrapher when with faultless and rapid transmission he humbles a great receiver by compelling him to beg for quarter. There is music in it, too, and the pride is pardonable, as every one who has been chained to a mad stream of dots and dashes by the hour in the stilly night, bending all his energies to keep the thread and write it down legibly, will admit. Therefore it is not to be wondered at that on way lines where ambition and ability are greatly out of proportion, there is always trouble in bad weather. The operators are, in the main, young and inexperienced. The lines, on account of the large number of instruments in the circuits, work hard. There is "breaking in," delay and bad temper. This is especially the case with railway telegraphs, where perfection is most needed. I have never been able to understand the niggardly policy pursued by many great railway corporations toward their telegraph department. Poor pay, overwork, miserable accommodations, have been the rule in the past. While money has been lavishly spent on sleepers, buffets and parlor cars, and all kinds of luxurious upholstery and conveniences, to attract the traveller by rail, the rail itself, the safety of the train and passengers, have been made to depend on the ability of some overworked boy at some far-off way station to resist sleep, at a time when he ought to be snugly tucked away in bed. If the travelling public could look more discriminatingly at the electrical equipments of railroads and take less account of tapestry and tinsel, they would in many thousands of cases, I am sure, change their line. It is an encouraging sign that at last the keystone and foundation of railroading, the telegraph service, is beginning to receive better recognition. Instead of allowing the telegraph department to flounder along under the direction of the master of transportation, or division superintendent of the road, with no electrical knowledge whatever, progressive roads now have superintendents of telegraph, and division operators, who, by their practical training and experience, are making great strides in the improvement of the service. When this plan is carried out generally, and when purchasing agents, who may know all about the various other supplies necessary for running railroads, are relieved from the selection of electrical apparatus, a great improvement will be effected. It may appear all right from the commercial standpoint of the purchasing agent to look upon a relay as a relay, a battery as a battery, and buy those which cost the least, but ten cents in the price of an instrument upon the effectiveness of which lives and property depend from one year's end to another, could not influence a practical telegrapher. Instead of forcing bad iron, bad wire, bad insulation, and clumsy, cheap workmanship, into telegraph apparatus, the quality and efficiency of instruments will some day be the prime stipulation. I have seen many telegraph relays rendered almost useless for want of a proper

retractile spring. This may seem a very small affair, but it is really very important. It affects the efficiency of the entire outfit and the quality of the service. Upon the quality of a relay spring depends the working of the instrument quite as much as upon the quality of the current, and yet it is only necessary to glance at the apparatus in any telegraph office to almost invariably discover that the relay spring is nearer a straight piece of wire than a spiral, and that at half turn either way will throw the relay out of operation. At the risk of having these few criticisms and suggestions ascribed to interested motives, I earnestly recommend them as worthy of consideration.

I will now proceed to explain how a great improvement may be effected in the operation of telegraph lines having any considerable number of way stations. I claim that this improvement is almost as necessary to the dispatching wire as the air-brake is to the train. It gives the dispatcher control of all his operators, prevents interruptions and delays, and, if the line can be worked between the terminal stations, all the intermediate offices will be in perfect working order. Their instruments will work as well in bad weather as in good. Operators cannot evade responsibility for neglect of duty or seek refuge behind the excuse that their instruments were out of adjustment on account of the bad condition of the line. Their instruments will always be in adjustment as long as the terminal offices can communicate. This I will, in a few minutes, demonstrate in a practical way over this miniature line, after a brief

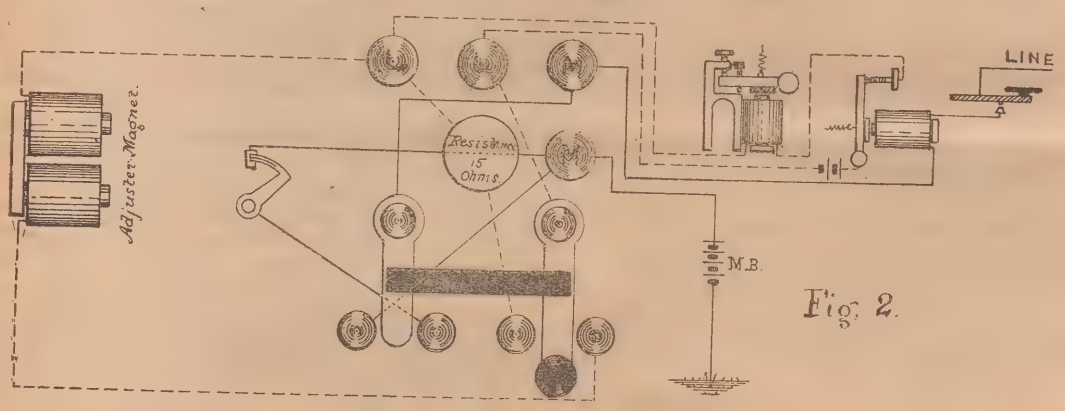


Fig. 2.

reference to the diagram of the circuit and connections which you have.

Fig. 1 shows a telegraph line extending from New York to Philadelphia, with New Brunswick and Trenton as way stations. There might be forty such stations, but these two will suffice for our illustration. The figure shows the ordinary outfit for closed circuit, single current working, the system used almost exclusively

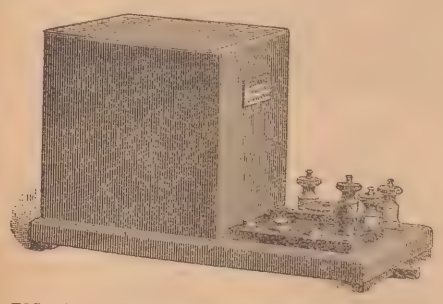


FIG. 3. TELEGRAPH LINE ADJUSTMENT.

in this country, and comprising a relay, sounder, and key, the only adjustment being the *adjuster*, A. This instrument consists of a magnet, armature lever, l, pawl, p, and stops a and b, ratchet wheel, r, on the shaft which carries the trailing finger, t, and the circle of segments. Alternating segments are joined to a common plate. Set S forms part of the circuit, while set, S', are not connected, but simply serving to make a smooth track for the trailing finger. Beginning at the Philadelphia end, the circuit may be easily traced from main battery, M B, and key to segment plate, S, upon which the trailer, t, rests. From the trailing finger to relay, R, through relays at Trenton and New Brunswick to New York, where it goes from relay, R', to trailer, t', segment plate, S, to key, main battery, M B, and to earth. The adjuster magnets are in the local circuit with the sounders, SR. Fig. 2 is a diagrammatic view of the switch connections of the adjuster for throwing it in or out of use, as the state of the weather or line may require. MM are the main line wires, LL the locals. The switch is now in neutral position. Of course it is never allowed to remain so in practice, as both the main and local circuits would be broken. Fig 3 is a perspective view of the instrument, inclosed and ready for use.

Let us assume that the weather is fine, and the line clear. The switch will be thrown to the left. The adjuster will be out of use, the line being connected outside of the trailer and segments, while a small resistance coil, shown on the switch, will be substituted for the adjuster magnet in the local circuit, the battery of which, on account of the adjuster is increased from two gravity cells to five. When the switch is in this position we have the present ordinary organization for working. Now, if a rain storm comes on, an intermediate earth route for the main batteries at New York and Philadelphia is established, and trouble with the adjustment of all the intermediate relays begins. If the escape be evenly distributed, Trenton will hear Philadelphia on a lower adjustment than that required for hearing New York, while New Brunswick will get New York on a lower adjustment than is necessary for receiving signals from Philadelphia. An office in the middle of the line would, if the main batteries were of equal strength, get New York and Philadelphia on the same adjustment but with greatly diminished current on account of the partial ground or escape on either side of him. Ordinarily, as all telegraphers know, there is a considerable margin of adjustment. I would not be understood to state that in all cases a radical change of adjustment is necessary. It will depend on the length of the line, the number of intermediate relays in the circuit, and the severity of the storm, or the general condition of the circuit prevailing at the time.

We all know, however, that on all way wires vexatious interferences and delays begin as soon as a storm sets in, and that New York might be calling Trenton, while Trenton, unconscious of the fact, might be endeavoring to get New York. When a few of these careless and inexperienced operators let themselves loose on a line during bad weather, the use of the wire is practically paralyzed. One of these oblivious free-lances may monopolize it for hours at a time, and it not infrequently happens that two of them, thinking the line idle, will strike up conversation, which an unappreciative and disgusted audience of fellows all along the line must listen to, while messages of life and death are awaiting transmission. Furthermore, operators cannot read so well when there is heavy escape on the line, because of the high adjustment required for their relays, and consequent "clipping" of the signals on the sounders owing to imperfect or light contact at the relay points. They must "break" and call for repetitions, and it often happens that rather than do this, they will guess at imperfectly received signals, the danger of which, especially on railroad lines, all can appreciate. The adjusting system is designed to overcome these difficulties. With what success you will soon have an opportunity to judge.

By throwing the switch to the right, the adjuster is instantly in use. If Philadelphia opens his key, and New York be adjusted, over the partial ground which I here insert between Trenton and New Brunswick, to represent a rainy day on the line, the New York relay R', will be affected, the armature pulled back by its spring, will leave its front stop and break the local circuit in which are included the sounder and the adjuster magnets, the pawl on the adjuster lever engaging a tooth of the ratchet wheel, r, on the shaft carrying the trailer, t', will push the trailer across the blank or dead segment of the plate S', thereby disconnecting the main battery at New York *for an instant*, during which time there is no battery on the line at either end, and consequently no current to keep the armatures of intermediate relays attracted to their magnets. Therefore, so long as the terminal offices can communicate with each other, all the instruments between will be in adjustment and intercommunication rendered almost as easy as during good weather. The operators at these offices are not only kept aware that the line is in use, but their relays work on a much lower adjustment, notwithstanding that opening at one end is but for an instant. The armatures of the relays having been released by this short break will not be attracted again readily by the re-establishment of the partial ground, or not until the battery is connected again at both ends, by closing of the key. When an intermediate office is sending, the line is opened at three points, the key as long as it is held open, and at both ends for an instant.

Now, if you will continue your kind indulgence for a few moments, I will endeavor to give you a practical demonstration of what I have been trying to explain.

The adjusters are now switched out. We start out with a clear day. All the relays on the line have a normal adjustment, and respond to the manipulation of any key Philadelphia is sending. The instruments at Trenton, New Brunswick and New York all receive the signals. By placing a lead from the line and ground wires in this jar of water we have in effect a rain storm, with its center between Trenton and New Brunswick, making quite a heavy escape. Now, when Philadelphia operates his key, the Trenton instrument speaks up as before, but New Brunswick and New York were silent. New York being a head office, however, has experienced and careful operators who take the precaution to try the relays on a high adjustment to see if anything is going on. Finding the line in use they adapt the adjustment to the changed condition. Now the adjuster comes into action and wakes up our friend at New Brunswick, who would otherwise be deaf to calls from Trenton or Philadelphia, and would at the same time be a ruthless trespasser if he had a message to send. It will therefore be plain that the instruments at all intermediate offices must work whenever it is possible to work the line from one terminal to another under the most delicate adjustment.

NOTE ON A NEW GRAVITY CELL.

I have taken too much of your time alre[ady] and I will make but the briefest refere[nce] this modification of the standard gravity [cell]. In fact, it requires but little explanati[on]. sulphate of copper is inclosed in [a] board box. The zinc in a paper e[nvelope] the rim of the jar has attached to

side by a sticky substance a band of rubber cloth. The advantages claimed for the cell are as follows: When the battery is first set up the dust of sulphate of copper is not instantly dissolved and diffused througout the liquid, coating the zinc with copper, as is the case with the ordinary cell. Several minutes elapse before discoloration of the fluid begins, and then only at the bottom of the cell, from whence it rises very gradually, never reaching the zinc. If the box be filled, the charge of copper is always uniform. Deposited or spongy metallic copper cannot fall upon the crystals from the zinc, and caking or massing in the bottom of the jar is thus prevented. The copper electrode is held firmly in position, always the same distance from the zinc.

A NEW GRAVITY CELL.

In a battery of any considerable number of ordinary cells it would be difficult to find two alike in this respect. There is little or no stalactite formations from the zinc, and consequently no local action, rendering the battery very useful for open circuit work. When water is poured in to make up for evaporation, the equilibrium of the fluids is not disturbed. The deposit on the zinc thus protected is easily removable, requiring no hacking or scraping. One zinc will endure two charges of sulphate of copper.

The band around the rim is one of the most important features of the cell, as it prevents zinc sulphate from creeping over. It offers simply a mechanical obstruction. It works perfectly in practice. Of course these strips or bands may be applied to any battery requiring them. They serve equally well for Leclanche battery, and to attach them to cells of any kind already up, it is only necessary to see that the rims of the jars are clean and dry. The sticky side of the strip should be heated slightly and pressed on firmly all around.

EDISON'S NEW BATTERY.

Thomas A. Edison has just perfected and patented a new cell for the use of telegraph main and local circuits, electro motors, electro-plating, telephone transmitters, electro-medical instruments, annunciators, burglar alarms, and all clases of open and closed circuit work. It is claimed to be the most perfect primary battery ever offered to the public.

The battery was originally designed for closed circuit work, in which field it is said to have absolutely no equal, but as its development proceeded it was found to be also equally adapted to open circuit work.

The internal resistance of one cell is .025, and remains constant during its full life.

Local action is less than one-half of one per cent., which means that there is obtained from this cell more than ninety-eight per cent. of the theoretical amount of power contained in the zinc.

The cells will deliver fifteen ampères of cur-
nt.

here is absolutely no polarization, and the never require cleaning.

istic potash solution is used, which is tured in sticks, so that renewal simply cing one of these sticks in a cell and he requisite amount of water.

There are made at present three different sizes, viz:

300 ampère-hour cell.
150 " "
15 " "

These ratings are based upon one charge of solution.

The copper oxide plates and the zincs have double the above capacity, two charges of solution being necessary to exhaust them.

It is the intention of Mr. Edison to make a cell having 600 hundred ampère hours, capacity, with one charge of solution, and to adjust the various types to suit the trade.

On heavy, closed circuit work the constant pressure of this cell is seven-tenths of a volt; on lighter closed circuit work eight-tenths of a volt, and on open circuit work the pressure is ninety-five one-hundredths of a volt.

For telegraph main batteries there has long been needed a battery that will deliver current to the line in wet weather. When a number of gravity cells, such as are at present used, are placed in series for a main battery the internal resistance of the circuit (that is, the resistance of the battery itself) is very high, the result being that when the resistance of the line is reduced by moisture, the relative proportion of current consumed in the battery is greatly increased, and telegraph wires are rendered inoperative, which frequently results in the complete interruption of important business, extending on railway lines to the serious delay of traffic on the roadway itself.

One hundred gravity cells in series have a combined internal resistance of over two hundred ohms; and therefore an appreciable quantity of current is always lost in the battery where these cells are employed. One hundred of the Edison cells in series have a combined internal resistance of only two and one-half ohms, which means practically that none of the current is lost in the battery, but the whole is delivered on the line. For this same reason, namely, low internal resistance, these cells are just as effective in wet weather as in dry, so far as the practical operation of telegraph wires is concerned, for only an inappreciable quantity of current would be consumed in the battery under the worst conditions of moisture ever encountered

In this class of work another great advantage is to be obtained through the use of these cells, which render it practicable to operate ten, twenty, thirty or more wires from a single battery.

Assuming that it is desired to run thirty lines from one battery of one hundred and fifty cells, the total resistance of the longest of these being 4,200 ohms, when all are equalized, the resistance of the outer circuit would be 140 ohms.

It would be impracticable to use gravity cells, as their combined internal resistance would be 300 ohms, and under most favorable conditions of weather only one-third of the whole current would be delivered on the outside lines; but with these cells, it is claimed, the combined internal resistance being only three and three-quarter ohms, practically all the current would be delivered on the lines and under all conditions of weather. Thus facility is afforded to concentrate main line batteries and to secure the more economical and efficient operation of telegraph wires. At present not more than four or five lines can be worked successfully out of one battery.

On such work as the above, which is exceptionally heavy in the field of telegraphy, viz: 150 cells operating thirty wires, these 600 ampère-hour cells would have a life of one month. For mere ordinary work the cells would last from three months to a year.

It is customary now in telegraph offices to use two cells of gravity battery to each local sounder. With this new battery it is claimed that four, six or a dozen sounders from one battery consisting of two or three cells can be run.

As before stated this cell will deliver fifteen ampères of current and it is therefore adapted perfectly for this class of work, other qualities considered.

Electro-plating requires quantity of current and these cells can supply it.

Open circuit work for telephone transmitters, electro-medical instruments, annunciators, burglar alarms and all kinds of open circuit work, this cell has absolutely no superior, owing to its exceedingly low and constant internal resistance; small percentage of local action; simplicity of renewal; cleanliness and long life. The internal resistance of the Edison cells being constant, their effective pressure remains the same during their full term of life. The Edison Manufacturing Co., Orange, N J., control the patents and is placing this battery on the market.

Electrocution.—We find in the London *Telegraphic Journal* and *Electrical Review*, Vol. VII., page 340, October 15, 1879, an article on capital punishment by electricity, which disproves that this method of meting out justice to criminals is of American origin. It reads: "Certain German writers who have for a long time reprobated the brutality of ordinary modes of capital punishment, have at length hit upon a scheme which satisfies their sentimental cravings. In a dark room, draped with black, and which is lighted by a single torch, the chamber of execution, there shall stand an iron figure of justice, with her scales and sword. Stern justice is popularly supposed to have no bowels, but this German version will contain a powerful electric battery in her inside; and this battery will be connected to an arm-chair, which is the seat of death. In front of the chair shall stand the judge's tribunal, and only the judge, jury and other officials of the jail shall be present with the condemned during the ceremony of execution. This will consist in the judge reading the story of the crime committed by the prisoner, who will be rigidly manacled to the aforesaid chair; and when this has been done the judge will break his rod of office and toss it into one of the scales of the figure of justice, at the same extinguishing the solitary torch. The descent of the hand will complete the electric circuit and shock the wretch into the next world. In truth, this would be a solemn, mysterious and dreadful death, and its conception is worthy of the genius of Edgar Allan Poe."

Canadian Cable Project Assured.—Hon. J. J. C. Abbott has applied to the Dominion parliament for incorporation of the Canada Atlantic Cable Company for the construction of a submarine cable from Greenly Island, straits of Belle Isle to the coast of Ireland, and for power, among other things, to do a general telegraph business, erect wires, etc., etc. The line is promoted chiefly by Mr. Dobell, Quebec's millionaire, who calculates that a capital of only $350.000 is necessary, as it will be the shortest and cheapest constructed cable under the ocean. The English government has agreed to consider Mr. Dobell's proposal to use British government cable between Ireland and England, and the English postal land system of telegraphy for inland transmission of messages. This would enable the Canadian company to dispense with offices in England The company will use the Canadian government land system along the gulf of St. Lawrence to Quebec. The Canadian government has been asked to guarantee the interest on $100,000 bonds, and is favorably considering the request, so much so, that it is almost about to be granted.

A device has recently been patented to inform passengers of the coming station, the number of miles from the terminus, etc. This will relieve passengers from the monotony of gazing into vacancy.

NEW WHEATSTONE BRIDGE TESTING SET, WITH BATTERY COMBINED.

This is a very convenient and portable instrument, combining in one case a rheostat, bridge, galvanometer, double contact key and five cells of latest and most improved form of chloride of silver dry battery, which will supply sufficient current for all ordinary conductivity tests up to one megohm.

The galvanometer needle is of peculiar construction and very sensitive, and will continue so for many years under all ordinary circumstances. The pointer is of aluminum, and of a sufficient length to show a clear reading with the least movement of the needle.

The galvanometer is so arranged that the apparatus may be placed in any position without regard to the points of the compass, as the galvanometer is so constructed that it can be readily revolved either to the right or left to obtain a zero point without in any manner interfering with the connections.

The bridge contains three coils on each side of respectively 10, 100 and 1000 ohms. In the rheostat the resistance coils are arranged

NEW WHEATSTONE BRIDGE TESTING SET, WITH BATTERY COMBINED.

in four rows of ten coils each. the rows being units, tens, hundreds and thousands, thus giving an extreme range of measurement from 1/100 to 1,111,000 ohms.

These instruments are all carefully adjusted in a thoroughly equipped electrical laboratory, far removed from all governable influences likely to create electrical disturbance, and are therefore very accurate.

The chloride of silver batteries were entirely separate from the testing set, and are provided with flexible selecting cords, whereby from one to the entire number of cells can be instantly connected to or disconnected from the instrument. This admits of the use of any battery which may be convenient when testing in the workshop or laboratory, thus reserving the chloride of silver cells for occasions where a portable battery is actually required. The chloride of silver battery, however, being a proper testing battery and doing the best kind of work, many will prefer to use it at all times; therefore the battery is so arranged that it can be conveniently removed from the case for shipment to factory for renewal when exhausted. The whole outfit is contained in a polished mahogany case, 9⅞ x 9⅞ x 5¼ inches, and weighs but 12½ pounds.

This testing set is manufactured by the E. S. Greeley & Co., 5 and 7 Dey Street, N. Y.

THE PROGRAMME FOR THE ELECTRIC LIGHT CONVENTION.

Secretary Garratt, of the National Electric Light Association, has just issued a bulletin giving a variety of information as to the work to be done at the convention to be held at Kansas City, on February 11, 12, 13 and 14, 1890, at the Coates Opera House. The papers are as follows:

Mayor Davenport will welcome the association and attending visitors to Kansas City.

President E. R. Weeks will open the convention with a brief address.

Secretary and Treasurer Allan V. Garratt will make the usual reports.

Prof. Elihu Thomson. Subject not yet announced.

Prof Henry A. Rowland. Subject not yet announced.

Prof. Rowland has very kindly consented to present a paper based upon a correspondence with the members of the association, now being carried on by the secretary, for the purpose of ascertaintng with what technical questions connected with the art of electric lighting they find the greatest difficulty.

Mr. Thomas A. Edison will give an address—the subject of which is not yet announced—by phonograph, which will reproduce Mr. Edison's voice loud enough to be heard in all parts of the house. As but few persons have ever heard Mr. Edison speak in public, this address from the phonograph will be of unusual interest.

Mr. Frank J. Sprague. Subject: "Electricity as Applied to Street Railways."

Mr. F. E. Sickels. Subject: "The History and Theory of the Steam Engine."

Mr. George H. Babcock. Subject: "The Economic Generation of Steam."

Mr. Myron D. Law. Subject: "Nine Years with the Arc Lamp."

Mr. C. A. Harber. Subject: "Line Insulation from the Standpoint of Practical Experience."

Mr. T. Carpenter Smith. Subject: "A Universal System of Central Station Accounts."

Mr. A. J. De Camp. Subject: "The Cost of the Products of Central Stations."

Mr. C. J. H. Woodbury. Subject: "Central Station Construction."

Mr. C. J. Field. Subject: "A Recent Edison Central Station and the Results Thus Far Obtained."

Mr. Henry W. Pope. Subject: "How our Paths may be Paths of Peace."

Mr. C. C. Haskins. Subject: "Prodigality in Economy."

Mr. E. F. Peck, in the discussion of Mr. M. D. Law's paper, will give the results of his numerous tests of arc light carbons.

Papers from several other prominent gentlemen are looked for and will be announced later.

Reports will be made by the Executive Committee, Mr. G. W. Hart, chairman.

Committee on Patent Legislation, Mr. Arthur Steuart, chairman.

Committee on Underground Conduits and Conductors, E. T. Lynch, Jr., chairman.

Committee on Harmonizing Electric Light and Insurance Interests, Mr. P. H. Alexander, chairman.

Committee to confer with Mayor Grant in regard to the International Exposition of 1892, Dr. Otto A. Moses, chairman.

Committee on Electrical Data, Mr. A. R. Foote, chairman.

Committee to memorialize Congress on th Abolition of Custom Duty on Copper, Mr. C. A. Brown, chairman.

Committee on Electrical Execution, Mr. E. W. Maher, chairman.

Committee on Standardization of Potential on Electrical Street Railways, Mr. E. T. Lynch, Jr., chairman.

National Committee on State and Municipal Legislation, Mr. A. R. Foote, chairman.

Electric Wires in Boston.—On December 2 Mayor Hart, of Boston, sent to the Board of Aldermen the following message:

"The Bedford street fire of Nov. 28, which destroyed precious lives and millions in property, is suspected to be the direct result of low-power wires coming in contact with a highly charged wire. Should this suspicion prove unfounded, the fact still remains that ordinary telegraph and telephone wires are an immediate source of danger the moment they touch an electric light or an electric power wire, such a thing as may happen in any and all parts of the city. This crossing of wires is the greatest danger to property with which we have to contend. Putting all wires underground is apt to increase the danger, because it brings all sorts of wires into close proximity.

"The true remedy is known to electricians and fire insurance companies and consists in a safety-fuse, or fusible alloy, inserted in every telephone, electric or other wire just before it enters a building. The cost of this contrivance is trivial and the protection it affords is almost absolute in that it breaks the continuity of conductors when these become heated up to the danger point. A great, constant and increasing danger can thus be averted, provided your honorable body will pass an ordinance, with a penalty attached for every case of disobedience, requiring every telephone. telegraph and other electric wire that enters any building in the city of Boston to be provided with a safety-fuse, or fusible alloy, satisfactory to the Fire Commissioners or the Superintendent of the Fire Alarm."

The message was referred to a committee. The Fire Commissioners sent the Board this little piece of wisdom:

"Electricity has become the most public and subtle form of distributing fire, and is the most dreaded factor that the firemen have to meet in the problem of extinguishing fires."

In the suit of the Electrical Accumulator Company *versus* The Gibson Electric Company in the United States Circuit Court for the Southern District of New York, which was instituted in February last, the complainants have recently moved for a preliminary injunction, and Judge Lacombe on Friday last granted the motion, and the injunction issued. The complainant's testimony shows conclusively that the Gibson Company has continuously infringed the Faure patent, and that their various modifications are infringements.

The *New York World* discussing the question of safe electric lighting, where high tension and alternating currents are used, devotes three columns and a half in a recent Sunday issue to a description of Okonite wire, and presents unimpeachable testimony showing that its use will make safe electric lighting under such circumstances a certainty. The article in question created a great deal of comment in electrical circles and contained a lengthy description of the Okonite Company and their new factory just completed at Dundee, N. J.

Thomas Alva Edison, it may not be generally known, gets his middle name from the town of his birth—Alva, O.

A new device combines a lightning [illegible] with a binding screw.

NEW ENGLAND LETTER.

Boston, Dec. 9, 1889.

The origin of the recent disastrous conflagration in Boston, involving a loss of upwards of $5,000,000, and resulting in the sacrifice of several lives, is still shrouded in mystery, but there is little doubt that the electric wires are directly responsible for the catastrophe. Certain it is that some remarkable phenonema were witnessed in various sections of the city many hours before the fire broke out. A large number of the electric time clocks throughout the city stopped at twelve minutes before eight o'clock on the morning of the fire, and a story is told of a woman who was employed in cleaning an office in a building adjoining the one in which the fire originated, the evening before, who claims that she saw a "ball of fire" playing about the electric time clock on the wall. Becoming frightened, she ran and called a man from another office in the building, but on returning, the phenomenon had disappeared, and the woman was laughed at for her fears. It will be remembered that the headquarters of the Electric Time Company were situated in the building in which the fire originated, and the insurance companies, as well as the general public, are now fully aroused to the danger of allowing any material capable of being carbonized on-switch-boards and cut-offs. Sooner or later municipal or legislative action will have to be taken, to compel the placing of all wires of low intensity, such as telephone and telegraph wires, underground, leaving only the high tension wires, as light and railway wires, in the air. The expense involved to individual corporations is too great to expect the reform to be made by them without compulsion.

It is asserted that the Thomson-Houston Company will increase its capital $2,000,000 by Jan. 1. The increase will be made to pay for the Brush Company recently purchased by the Thomson-Houston. It is said that $200,000 of the purchase money will be paid down; the balance at the rate of $200,000 a month for ten months. The Thomson-Houston will not assume control of the Brush Company until the last payment is made.

Westinghouse Electric Co.—Mr. Barnes, agent in New England for the Westinghouse Company, has recently sold the following apparatus: South Brunswick and Salmon Falls Electric Co., Me., 750 alternating-current incandescent light plant, and a 20 light arc machine. Insolated plants: Waltham, Mass., 126 incandescents; Nelson D. White & Sons, Winchendon Springs, Mass., 300 do.; Carew Manufacturing Company, South Hadley Falls, Mass., 50 do.

Thompson-Houston Motor Co.—In response to the invitation of Mr. H. C. Spaulding, of the Thomson-Houston Motor Co., about 21 members of the Paper Trade Association, of this city, paid a visit to the company's works in Lynn, on Wednesday, of last week. The paper men were greatly impressed with the immensity of the business transacted by the electric company—the large number of factories, employing nearly two thousand hands, and they spent several hours in inspecting the different departments.

Abington, Mass.—A company is organizing for the purpose of supplying the towns of Abington, North Abington and Rockland with electric light. $40,000 is the proposed capital, and the plant will have a capacity for 1,300 incandescent and 60 arc lights.

Springfield, Mass.—The United Electric Co., Springfield, Mass., has increased its capital from $150,000 to $300,000, to enlarge and extend the plant. Most of the increase has already been subscribed.

Rockland, Me.—The contract for 40 arc lights [illegible] Rockland, has been granted to the Eastern [illegible]ctric Light Co., of New York, the plant to be [illegible]eration by March.

[illegible]ord, N. H.—The Concord Horse Railroad [illegible] will change from horses to electricity, at [illegible]bout $30,000. The Thomson-Houston [illegible]e employed.

Eastport, Me.—The Eastport Gas and Electric Company has been incorporated, with a capital stock of $50,000. It will furnish electric light, heat and power; also gas and steam.

Laconia, N. H.—The Winnepiseogee Gas and Electric Company, capital stock, $50,000, has been incorporated at Laconia, N. H.

Taunton, Mass.—The Taunton Electric Light Co. will increase its capital stock to $60,000.

ELECTRICAL PATENTS GRANTED, NOVEMBER 26, 1889.

415,695. Armature plate. 415,696. Coil guard for armatures. 415,697. Armature; Warren S. Belding, Englewood, N. J.

415,700. Telephone receiver; James W. Bonta, Philadelphia, Pa.

415,710. Separable electric conductor for railway gates; Frank E. Fowler, Lynn, Mass.

415,747. Electric meter. 415,748, 415,749. Electric transformer; Elihu Thomson, Lynn, Mass.

415,751, 415,752. Joint for coupling underground cables; Bror H. Wesslau, Charlottenburg, Prussia.

415,765. Circuit for multiple switchboards; John J. Carty, Cambridge, Mass.

415,766. System of electrical distribution by secondary batteries; Stanley C. C. Currie, Philadelphia, Pa.

415,805. Lathe for winding armatures. 415,806. Armature for electric machines; Warren S. Belding, Englewood, Assignor to Belding Motor and Manufacturing Co., Chicago, Ill.

415,817. Electric appliance for winding clocks; F. A. Lane, New Haven, Conn., assignor of one-half to Frank E. Morgan, same place.

415,856. Electric heating apparatus; Chas. E. Carpenter, Minneapolis, Minn.

415,864. Composition for overhead insulators; Samuel H. Gilson, Salt Lake City, Utah.

415,871. Electro automatic valve; Mary A. Kissell, Chicago, Ill., for herself and as executrix of Abraham S. Kissell, deceased.

415,915. Electrical annunciator; Charles E. Lee, Rochester, N. Y.

415,936. Electrode for secondary batteries; Joseph Y. Bradbury and Frank J. Stone, Lowell, Mass.

415,962. Composition for lining electric battery jars. 415,963. Galvanic battery; Oscar A. Enholm, New York, N. Y.

415,975. Galvanic battery; Gustav Otto, Jersey City, N. J.

415,981. Secondary battery; Walter F. Smith, Philadelphia, Pa.

415,990. Electric trumpet; J. P. Zigang, Domfront, France.

416,013. Dynamo-electric machine or motor; Andrew L. Riker, New York, N. Y.

416,051. Incandescent lamp socket; Paul J. Chassague, Akron, Ohio.

416,122. Insulating hanger; Wm. R. Park, Philadelphia, Pa.

416,126. Method of making supports for electrodes of secondary batteries; Walter F. Smith, Philadelphia, Pa.

416,138. Method of automatically flushing by electricity; Henry C. Weeden, Boston, Mass.

416,148. Secondary electric clock; Eason L. Slocum, Pawtucket, R. I.

Controlled by New Yorkers.—St. Louis, Dec. 6.—The control of the Municipal Electric Light Company became a fixed fact this morning. All interests were finally harmonized. Ladenburg, Thalmann & Co., of New York, now control all interests.

Chicago, Dec. 6.—An assignment was made to-day by Hugh G. Smiley, of the firm of G. A. Harmount & Co., dealers in electrical supplies. The assets are said by Smiley to be $4,800 and the liabilities $40,600.

MR. WESTINGHOUSE REPLIES TO MR. EDISON.

Mr. George Westinghouse, Jr. replies to the article written by Mr. Thomas A. Edison, in the current issue of the *North American Review*. Mr. Westinghouse contends that commercial considerations demand a preference for the alternating current; that it is a question of dollars and cents—large copper wire *versus* small copper wire. He says:

"Accepting Mr. Edison's classification of the currents used for electric lighting, let us discuss them as follows:

"'*First*—The low-tension continuous current, with a pressure not exceeding 200 volts, used for incandescent lighting.

"'*Second*—The high-tension continuous current, with a pressure of 2,000 volts and over.

"'*Third*—The high-tension semi-continuous, or pulsatory current, with a pressure of 2,000 volts and over.

"'*Fourth*—The alternating current, with a pressure of from 1,000 to 3,000 volts and over.'"

"The first is not dangerous when a person comes into momentary contact with one wire, but no one can endure its passage through the body when the contact is made 'in the most effective manner.' I have witnessed the roasting of a large piece of fresh beef by a direct continuous current of less than one hundred volts within two minutes. Any one having access to electric lights operated by the low-tension underground system in New York can easily prove to his own satisfaction how much credence ought to be given to the assertion that a current of 200 volts can be passed through the human body without producing uncomfortable sensations. Let him connect a tin pan to one of the electric wires, and place therein a thick piece of beef, and upon this a gridiron of metal connected to the other wire. The electrical energy exhibited in the steaming and cooking of this beef may possibly surprise the experimenter. If the current is from an underground main, the experiment may be varied by connecting the gridiron to a water-pipe with like results. With even less than one hundred volts it is painful beyond endurance to press firmly with the hands the brushes or any bright brass-work of the dynamo, or to grasp any metal connected with the wires.

Some interesting experiments are about to be carried out at Cherbourg, with the view of testing the possibility of establishing telephonic communication between vessels of the same fleet at sea. It is stated that a preliminary trial, which took place recently, demonstrated the fact that a torpedo boat can be kept in communication with the command afloat, and receive direct orders as to where to steer and how to act in general operation.

Very little has been heard of late about electric welding, but the Thomson Company is still at work and has attained some wonderful results, such as that of welding wire cable one and five-sixteenths inches in diameter, preserving 87 per cent. of the efficiency of the rope. That is a much better result than anybody expected when Prof. Thomson first made his interesting experiments.

The opening of the new telephone line between Buda Pesth and Prague led to so much disputing as to the language which should be used by the employees that it has been decided to use French. By this means alone could the rival claims of Czechs and Magyars, Germans and Poles be satisfied.

A Paris dispatch says: The Government has issued new regulations for improving the telephone service which has recently been taken over by the State. A new scale of charges has been arranged.

THE EASTON SYSTEM OF ELECTRIC LIGHTING.

FIGS. 1, 2, 3 AND 4.—DYNAMO LAMP AND SWITCHES, EASTON ELECTRIC LIGHTING SYSTEM.

The Easton System, although but recently brought before the public in the United States, is not in any sense an untried or experimental one, having been in use in the Dominion of Canada under the name of the Reliance System for nearly two years without developing any defects, but winning a reputation for reliability in action, freedom from necessity of repair, excellence of results produced, and ease and economy of operation, that has given it a phenomenal success in that country. Beginning by placing a capacity of 225 arc lamps in the first year, in face of bitter opposition, the Reliance Company in the second year was enabled to place a capacity of 1,175 arc lamps, being over five times the business done in the previous year. This record bids fair to be eclipsed by their third year's experience.

Some of the peculiar features of this system are not yet fully secured by letters-patent. The system is the invention of Mr. James W. Easton and comprises, as now perfected, an improved dynamo, an improved arc lamp and accessory appliances for use in distribution of electrical energy in its varied applications to lighting, heating and also the transmission of power. The armature sections are automatically and positively protected from the over-heating, and consequent "burning out," of the insulation of the wire composing the sections, if short circuits occur in the commutator by settling of metal dust, injury from blows, or otherwise. The device for mounting and driving the armature tightens automatically, if necessary, and in doing so preserves the mechanical balance of the moving parts. The field magnet is so designed and arranged that the magnetizing force is applied to the armature core in the most economical manner, producing a uniform degree of magnetization throughout the mass and also the least practical amount of leakage from one polepiece to the other and consequent loss of energy through the exterior "atmospheric" field.

There are various other minor, but important, details of construction of the parts that go to make up a perfect whole. The method of protecting the armature section from injury due to a defective commutator is simplicity itself, although from its very simplicity arises a difficulty in properly describing its action. The importance of this feature may be understood from the fact that not less than 90 per cent. of all "burnt armatures" may be and *are* traced to some defect in the commutator. "Struck by lightning" is the explanation of the defect frequently given to the purchaser by the makers, who must repair the damage caused by the imperfections of their own apparatus.

In carrying out Easton's method of protecting the armature from injury, the first notable difference from other systems observed is in the connection of the sections to each other. In other systems this connection is made at the point of contact with the commutator, and any breakage of the wire forming the connections "opens the circuit" in the armature and stops the flow of current at once.

As these wires are unsupported, and more or less exposed to breakage from vibration and accidental injuries, this is an important defect in such systems. In the Easton system the connection is made by a firm, soldered joint at the surface of the armature itself, and the wires are supported, and protected from accidental injury, equally with the balance of the wire which composes the winding, as the Gramme, but all previous devices for mounting and driving the smooth, cylindrical armature have been very imperfect. In the Easton system the shaft in the dynamo is a large screw-bolt that draws all the running parts firmly together. The normal strain of driving the armature keeps the shaft perpetually screwed tightly. In accomplishing this result a simple contrivance is used consisting of a collar on the shaft, formed integral therewith, which acts as the head of a bolt on the shaft and against the collar.

The arrangement of field magnet seems very singular and even unscientific at first glance, or until the reasons for its peculiarities are known. To begin with, a certain property of magnetism must be known and taken into account. Magnetism like static electricity has a property of self-repellance, and tends to distribute itself most markedly around the ends of cylindrical objects, and the ends and corners of all classes of objects, to the weakening of the force manifested at the centre of the cylinders or plane surfaces. This has caused many designers to make all the surfaces exposed to the air free from corners of all kinds, with the intention of decreasing the leakage; but the leakage is dependent upon the average distance from polepiece to polepiece and to the surface exposed, so that the actual result thus attained is to equalize the leakage and make it less noticeable. Now, when long pole faces are presented to an armature core, in the first place the magnetic force is much the strongest at the ends, and also the tendency of the magnetic force in the core would become the strongest at the ends if the magnetizing power were to be equally applied. But the magnetizing force is also the most powerful at the ends and the resultant action is that the ends of core are magnetized to saturation very quickly, while the center is scarcely acted upon, and a magnetizing force, greatly excessive, is now required to bring the centre of the core into action and this means poor economy for operation.

Mr. Easton is now engaged in working out the details of a transformer system, but is secretive regarding his proposed improvements, the only thing learned being that the details are all within the lines of operation of well-known laws; also that he does not propose to use either motor-generator or the alternating current. Arc lamps will be run in series with the transformer. In all probability, therefore, the current cannot be an alternating one; but how he can operate direct transformers by the direct current seems to be a mystery, but Mr. Easton is positive that he knows how to do it. He says the idea must remain his secret for yet a short time, and his success in the past is good guarantee that he knows what he is doing in the present, and proposes to do in the future, if he lives to carry out his varied plans and designs.

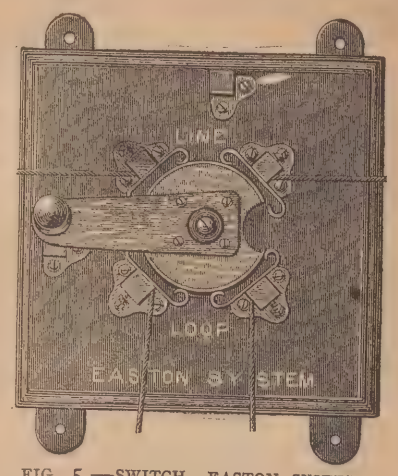
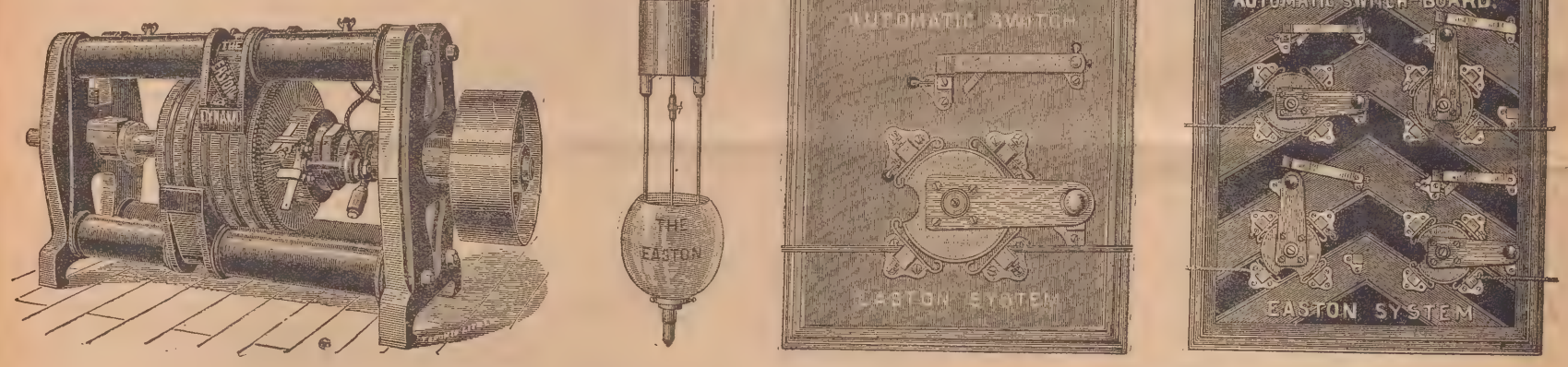


FIG. 5.—SWITCH, EASTON SYSTEM.



FIGS. 1, 2, 3 AND 4.—DYNAMO, LAMP AND SWITCHES, EASTON ELECTRIC LIGHTING SYSTEM.

MORE HONORS TO AMERICAN MEN OF SCIENCE.—Almost immediately after the close of the Paris Exposition, Mr. Carl Hering, whose name is so intimately connected with electrical advance in the States, received the compliment of a banquet given in his honor at the Cafe Robinet, Boulevard Montparnasse. His being invited to meet some of the leading and most potential electricians of Paris at this restaurant was most fitting and appropriate, for it is the headquarters of the little world of electrical science in Paris, as the Quartier Montparnasse is the seat of struggling and successful students in all branches of art and science. It is the headquarters of the celebrated Electrical Society, "de la Planche," whose monthly meetings always preceded all great and new improvements or inventions in electricity, and it is no mean compliment to our fellow countryman that he was invited to receive hospitality from his confrères in the dining hall of this noted scientific club, composed as it is of some of the very highest names in the electrical coterie of Paris, and indeed, for the matter of that, in all France.

An electric light company is said to hav[e] been organized in Bankok, the capital of Sia[m]. The king himself has subscribed for 2875 sh[ares] of the total issue of 6900 shares.

London talks of placing electric l[ights] horses' heads during heavy fogs.

AUTOMATIC TELEGRAPHY.

In the *London Electrical Rev[illegible]* October 11, we find the following editorial:

"We hear that a syndicate for the promotion of a fast-speed telegraph system is at present in London exhibiting the apparatus; it is claimed that 500 words per minute could be obtained through an Atlantic cable. The apparatus includes a dynamo, a steam engine, and an induction coil giving a *continuous two inch* spark. How any telegraph inventor, who has common sense, could suppose that such a potential would be permitted or could be used on a cable is surprising. The idea that such a high speed as that named could be obtained through a cable is perfectly childish; we are quite certain that no proper experiment could have been made to prove that the apparatus could work, as there is no artificial cable that would carry such a high potential without "sparking across" taking place. Some few years ago an American fast speed apparatus, which worked at 1,000 words a minute, was tried in this country; this speed was obtained through an ordinary resistance (the usual [illegible] of those who know nothing about practical [illegible]ny), but when the apparatus was connected to an aerial line 400 miles long, the result was—30 words a minute; the promotors, after this experiment, scuttled back across the water, and subsequently orders came for several complete sets of Wheatstone fast speed instruments to be shipped to the States."

Mr. D. H. Craig, who has made the subject of automatic telegraphy the study of his life, says in reference to the above:

"As to the closing paragraph, the *facts* are that the American fast speed apparatus was forced to operate through an underground wire of high resistance and with less than half the proper battery. It nevertheless accomplished over 500 words per minute *from* London to a station 400 miles distant, but from that point *to* London the speed of transmission was very much reduced, owing to the high resistance of the line wire and the excessive resistance of the last 14 miles of London underground wire.

With a proper aerial wire and battery, "the Americans" could now telegraph both ways over 2,000 words per minute, every day in a year."

New York Electrical Society.—This society is said to be the oldest of its kind in the country. During the present season it will introduce to its members a number of the leading men in the electrical profession, who will handle the subjects with which they are most familiar and of which they are acknowledged masters. From such a course of papers and lectures as has been arranged, there can be no doubt that a great stimulus will be given to the study and application of electricity in New York; and the society therefore confidently appeals to those in any way interested in electricity for all the support that they can give. Among the papers and lectures already read this season are "Electrical Exhibitions, and a Description of Recent Electrical Developments in Europe," and "How to test Electric Motors." Among those yet to come are "Progress of Electric Railroads," "A Talk on Cables," "The Electrical Torpedo—New York's Sole Defence," "Storage Batteries," "The Incandescent Lamp," "The Telegraph," "The Telephone," "The Alternating Current," "The Galvanometer and its Uses," "Electricity in War," "Phantom Wires," "How to run an Electric-Light Station," "Transformers," "Power Transmission," "Laboratory Manipulations," "The Solid Side of the Electric Street Railway," "The [illegible]tion of Every day Electrical Problems," "The Progress of the Year." The officers [illegible]ociety are as follows: president, Fran[illegible]cker; vice-presidents, Joseph Wetzler, [illegible]rbes and Dr. Otto A. Moses; secre[illegible]e H. Guy; treasurer, H. A. Sinclair, [illegible]. Pendleton, C. O. Mailloux and

The important problem of obtaining electricity direct from coal has been engaging the attention of other scientific men besides Edison. Prof. John Perry, in a recent address in England, called attention to the fact that in 1881 he pointed out that if coal or gas were burned in a voltaic cell, as zinc is burned, not merely one-tenth, but nine-tenths of the energy of coal could be utilized as mechanical energy. He also showed that coal could actually be burned in that way at that time, but that the apparatus required was too large and too expensive.

The execution last month of a man for murder in Andalusia, Spain, twenty four hours after a reprieve had been actually signed by the Queen and forwarded, has occasioned so much excitement in Spain that the Government has drawn up a bill to give to a telegraphic message in such cases the force of a formal written order.

It having been found during the recent English naval manœuvres that the electric search lights on some of the ships were awkwardly placed, the Admirality is taking steps to remedy the defect, in place of the towers, which are very inconvenient

The Gas-Electric Company, of Amherst, Mass., has leased land on College street, just east of the Hills Company's storehouse, for twenty years, and has broken ground for a new building for the electric light station.

A new incandescent dynamo, with a capacity of 150 lights, has just been placed in the pulp mill of the Eastern Manufacturing Company at Brewer, Me., and the establishment is now being wired for the lights.

The British-American Investment Company is backing up a project for the construction of an elevated electric railway in St. Louis. Work is to begin at an early date, as all the capital has been subscribed.

Leeds (England) textile mills are adopting an electric invention that stops the engine as soon as an accident occurs. The connection is made by breaking a pane of glass on the wall.

The Western inventor is endeavoring to interest capital in his electrical magic lantern for casting or reflecting advertisements on the dark clouds that often hang low over a city.

The Peninsula Electric Light and Power Company, of Cannoch, Mich. has enlarged its plant. Two new dynamos have been added, a 50 light arc machine and a 30-lighter.

The Jenney Electric Light Company's new station at Peoria, Ill., is rapidly approaching completion. A local paper says that the plant will be one of the finest in the State.

The 100-light dynamo at the railroad shops, Lyndonville, Vt., has been exchanged for a 300 light machine, the first being insufficient for the light required.

Two hundred electric lights are being put into the upper parts of the large north building of the National India Rubber Company's mill at Bristol, R. I.

The Electric Light Company at Charleston, S. C., has made a bid for the entire city lighting, and the council is seriously considering the proposition.

The Santa Clara (Cal.) Electric Light Company has increased its power plant. A new Westinghouse engine has been ordered.

The Cincinnati Board of Public Works has ordered the electric light wires to be buried. The order awaits the approval of the council.

Concord, N. H., will introduce electricity as a motive power for her street cars.

The citizens of Seattle, Wash., are calling for electric motors.

New Electric Railroad.—Harry W. Smith, a Newark inventor, has constructed an electric railroad on one of the wharves of that city to demonstrate a new principle in electric propulsion. It not only does away with overhead wires, but with continuous currents as well. It is a conduit system, but the conduit is without a slot, and is practically water tight and air tight. To keep it dry a blower or exhaust fan will keep air constantly circulating through it. The conduit is placed midway between the rails, and in the full size model it is made of wood, with a series of heavy brass plates on top. In the bottom of the conduit is a copper strip insulated from the conduit. The brass strips forming the cover of the conduit are four or five feet in length, and are rubbed by copper brushes, which conduct the current to the motor in the car. There is no flow of current outside of the conduit except directly under the car. Elsewhere the current is flowing peacefully along the copper rod in the bottom of the conduit. Connection between the copper rod and brass plates is formed by permanent magnets preceding the brushes under the car. These magnets pick up successive pallets or levers in the conduit, and the pallets form contact between the rod and the plates. As soon as the car passes one of the strips the levers drop by their own weight and break circuit in the conduit. One of the rails is used to form the other half of the metallic circuit as in overhead systems. Mr. Smith's model car carries six persons rapidly with a current measuring 70 volts. A practical road is to be put down in one of the suburbs of Newark.

Texas man—I ain't in favor of no such nonsense as buryin' the telegraph wires.

Eastern traveler—Oh, it only applies to cities.

Texas man—I'm glad of that, for if the poles wuz to go I don't know what we'd do for lynchin' parties whar trees is skace.—*Pittsburg Chronicle.*

It has now become a well-established fact that waste water power can be converted into electric energy, conveyed from ten to one hundred miles on, a small copper wire in amounts from ten to five hundred horse-power, at a cost not to exceed $6,500 per mile for the greater distance and the larger power.

The use of electricity in surgery is extending daily. It is now largely employed in England in gynæcological cases. It has long been known to be capable of relieving neuralgic pain, and has now been applied to cases of ovarian neuralgia, the treatment of which presents peculiar difficulties.

The Julien Electric Motor Company is at work again with storage batteries, which are said to avoid infringement of the patents which the courts recently upheld, and to be superior to those heretofore used.

It is now proposed to put in an electric light plant at Belfast, Me., using the Westinghouse system of lighting. Power will be taken from the dam at Mason's Mills, and wires will be run to Searsport.

Mr. Harold P. Brown has issued a report and recommendations to the Health Department upon the dangerous systems of electric lighting, with explanations of the same as used in New York.

The Boston Art Club has contracted with the Boston Electric Light Company for 160 incandescent lights.

Erie will soon be on speaking terms with New York. She is to have a long distance telephone.

Thomas A. Edison is looking after his ore crushing interests in the iron regions.

Boston Herald: An electric wire is an ugly thing when anything crosses it.

AN INVENTION AND A REMINISCENCE.

BY JOSEPH HURLEY.

The New York *Sun* of September 12th favorably mentioned my cipher, and now that it is spreading, I hasten to lay it before the public for fear that McGinty, or some other electrician, should claim it, at the same time cautioning all against its use, except subscribers paying royalty. Take an English word, reverse it, and read it in Morse characters backwards. This makes the letter "G" a "W". The word "and" would be "uan," etc. That's all the explanation necessary. What the business man needs is a cipher which, while being a mystery to outsiders, will be plain to operators handling it in transit. As they are delivered now neither party understands them. How can an operator tell what horse to lose his money on, if he cannot decipher the tips?

The idea of this invention grew out of the prohibition laws in Kansas. I used to loan the cipher to an intemperate friend in Topeka and his frequent order of "Ogt Sceev" was puzzling to the telephone people. He also took lunch at the same place as the attorney general, and that official used to be disgusted whenever such direct evidence of a leak in the laws was brought home to him.

All inventors submit to a series of snubs before being knighted. I wrote to the War Deparment, offering this secret for a small lump sum. The negotiations were almost completed when some fresh clerk called the Secretary's attention to the fact that a person would need to study telegraphing two years before starting to learn the cipher. My letters are unanswered since.

Some correspondence on the subject with Camp 20 of the Clan-na-Gael in Chicago brought detectives on my trail, thinking they had captured "Cooney, the fox."

I have decided to float the cipher with canvassers. There are three out on it now in New York. They have been out since pay-day, but are ex-waiting-list men and good hustlers. If they have not "hocked" the copy right by this time, I expect to make enough out of it to quit telegraphing.

The last effort I made to leave the profession came near being successful. A gentleman was talking shop with me in the Paxton House in Omaha and, speaking of the merits and demerits of the business, he said that while a city operator's social status was seldom above zero, let him go into a country town as "the operator," and he immediately ranked next to the mayor.

In the city he might be out of work, money and everything; but once he took a railroad position in a small place, he was thrown in with the merchants and best people of the town; of course, whether he retained this start depended on himself. My friend said he had known many who had done so and were now in other business.

He always said solid things like that, but I remember now that he always kept in the large cities himself.

However, his words impressed me so that I gave up an $80 commercial position, went through a rigid examination at the headquarters of a railroad, and, with some Congressional influence, succeeded in getting a position at a salary of $65 (for every two months). My destination was kept secret until the train was moving, then the pass was handed me, as the Navy Department give war vessels their sealed orders.

The name of the town was Ong. I found it in the State of Nebraska. It is there yet, but the telegraph office has since closed. What the town was christened after is a mystery, as there is not a Chinaman in the place. 'Twas humiliating to a man who had worked in such long-armed cities as Zacatecas and Medicine Hat.

Ong had just lost the county seat and the villagers felt very sore. They would not tell me the cause, but it was a plain case of "asleep on duty."

I made myself unpopular by taking the stand that the telegraph office should have gone with the county seat. We argued this in the office of the hotel. There were some others playing cards in the next room. When the argument was over, I heard with dismay that the supper was also.

It appears I had mistaken the evening meal for a four-handed game of casino.

The station was a mile distant and isolated in a very lonesome spot. The agent hurriedly posted me on my immediate duties. First, climbing up the roof of the station to put the signal on the chimney.

He also explained the switch. 'Twas a new make to me—only three plugs in it, and cut in for the main line. At the top, where I had been used to lightning arresters, there was an alternate red and white lamp. When you turned the switch to the right, it threw the train on the crossing side track, and to the left, on the gravel pit siding. He also left me his revolver. During the night a tramp walked in on the track. I heard him for a quarter of a mile, and as soon as I was satisfied that the footsteps were not those of a bear, I went to meet him and presented him with the freedom of the city. This he declined. He was broke and an actor, but had played in the town on his up-trip. I flagged the "cannon ball" express to let him on, and afterwards wrote seven different explanations of this generous act.

Next night a freight train stopped of its own accord. I was surprised and thought something had broken. The conductor handed me a waybill, reading "1 pc. Agl. Imp." While trying to make out whether this was a box of chemicals, or a Prince Charles imported spaniel, the three brakemen yelled to me in chorus to come and help them to get it off. 'Twas on two flat cars and turned out to be a piece of a fanning mill, weighing 2,300 lbs. I left the "agl. imp." where it fell. The agent thought in the morning that it should have gone in the freight shed, but I knew that the farmers could load it better where it was.

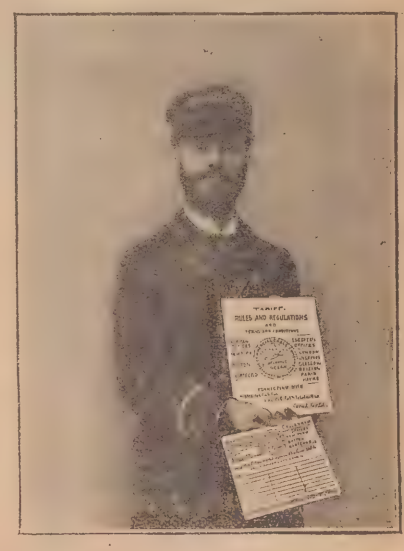
The mayor never called on me until the fourth day. It was about shooting the pistol off at night. He told me to stop it. My hours had lengthened. I was now working from six in the evening until six the next evening, with one hour for dinner. I had not taken a message, or train order, yet, and when I tried to converse on the wire, for practice, and to try and find out the advantages of the situation, the despatchers always insulted me. Once or twice, while loading bags of flour, I complained to the agent that I had been brought up strictly as a telegraph operator and was not strong at other things. He did not get mad. It seemed to amuse him, and when I said that I was used to extra for Sunday, 7 hours to a day, he laughed outright. Next morning, after unloading 23 stoves, I quit abruptly. It occurred to me with an apron on and my hands and face black with stove polish. Considering everything, my duties, the cobwebs on the relay, the salary and the name of the town, how near I was to leaving the business; why I could have stepped out of it; I might have sneaked away. In hurrying from the scene, I learned that one of the night operators near me made cigars at night and sold them to the train hands. Another man caught fish near the depot and sold them to the villagers at 7 cents per ponnd. I didn't fancy either of these trades and don't know yet whether those gentlemen venders were "going out" or "coming in" the profession.

I don't mind relating this experience now, but when I reached Omaha, I was much crushed. To all inquiries as to where I had been I gave the evasive, but, oh, how truthful, answer that I had been "out on the border."

The second edition of Terry and Finn's "Illustrations and Descriptions of Telegraphic Apparatus" is being disposed of very rapidly, and from present indications it has met a long-felt want. This book has given the telegraphic profession more light in plainer language on the knotty electrical problems than any other work ever published. It was written to educate the operator, and it is fulfilling its mission admirably and successfully. The price is but $1.50.

ENTERPRISING CABLE PEOPLE.

The Commercial Cable Company is out with a clever dodge to secure cable business from passengers arriving on incoming ocean steamers. In the month of April last it occurred to Mr. G. G. Ward, the popular general manager of the Commercial Cable Company, that the patrons of his line, arriving by incoming European steamers, were much inconvenienced by not having their cables despatched promptly on landing at the steamship piers in New York. Mr. Ward immediately conceived the idea of appointing a responsible uniformed representative to meet the arrival of all European steamships to receive cablegrams so that the patrons of the Commercial Cable Company could, on the docks, be accommodated with that quick and reliable service for which the company has already become so famous. Accordingly, Mr. J. Delaney, clerk in charge of the company's office in the Hoffman House, was appointed, and, attired in a handsome and attractive uniform, to meet the arrival of all European steamers, to represent the Commercial Company. The arrangement has proved very successful, and Mr. Ward is to be congratulated on his enterprise.



MR. J. DELANEY.

$10.00 AND $5.00 FOR ORIGINAL STORIES FROM LADY SUBSCRIBERS.

Here is an opportunity for our lady subscribers to earn one of two prizes for story writing.

The ELECTRIC AGE will give $10.00 to the lady telegrapher who composes and sends us for publication the best original telegraph story. A second prize of $5.00 will also be given to the lady telegrapher sending the second-best story.

The conditions are: 1st. The lady must be a subscriber to the paper; 2d. The story must not exceed 500 words in length, and *one* side of the paper only should be written on.

A nom de plume may be used if preferred.

Two stories from the same author will not be admitted in the same contest. The prizes will be awarded when not less than ten stories have been printed, and at least two of the stories will appear in each issue until that number has been reached.

Mr. George E. Holbrook, President of the New York Telegraph Club, has kindly consented to act as referee. Mr. Holbrook possesses well-known literary ability, and any decision he might render is certain to give general satisfaction. Now let the ladies contribute.

Mr. D. Lynch, lately of the Commercial Cable Co., at Waterville, Ireland, is now at the W. U. at the cable-hut, Co[illegible]. He is to work the syphon recorder on the cables.

NEW YORK'S ELECTRIC SCAFFOLD.

The chair of death in which the New York criminals are to sit is still at Auburn.

But one chair will be used in the three State's prisons. It will remain in the prison where last used until a murderer is to be executed in one of the other prisons.

Work has begun on the erection of the building in which the executions are to take place. This building will be to the south and adjoining the wing in which are located the solitary confinement cells at Sing Sing.

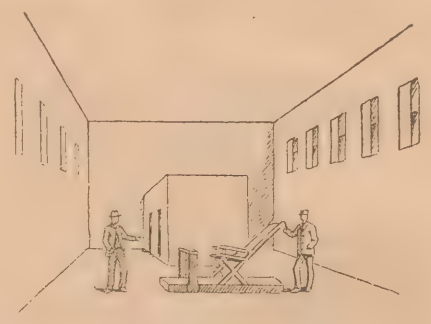
It will be 16 feet high and 30 feet square. The walls will be of brick a foot thick, whitewashed on the inside. The ceiling will be whitewashed, and the floor will be of white cut marble.

On each of two opposite sides of the room there will be five narrow windows. They will be 10 inches wide, and about 4 feet up and down. The windows will open on hinges, and will be protected by two bars crossing each other at right angles.

Ten feet will be taken off one end of the room for four cells, in which culprits awaiting execution are to be confined. These four cells will be in two rows, back to back, with the doors facing the opposite windows. The cells will be about eight feet high.

Across the room at the opposite end from the cells will be the death-chair. This chair cannot be seen from the cells, so that an execution will not be in view of the other condemned prisoners.

The electrical machinery will be in the stove shop, and a wire will be carried 1,000 feet over the

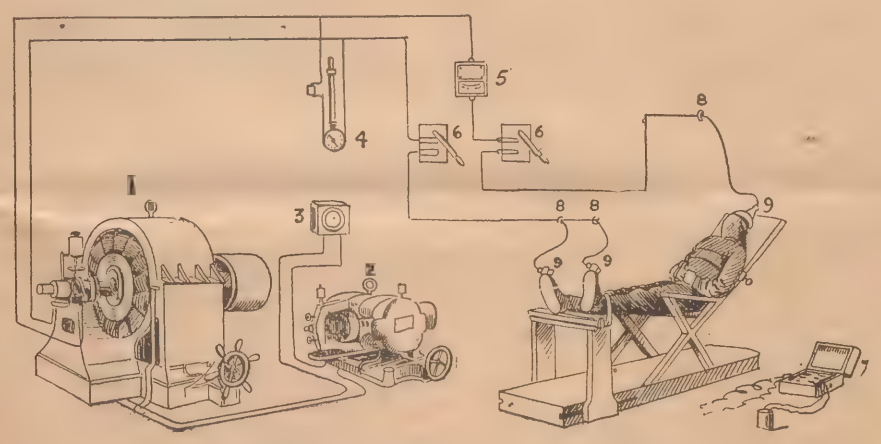


THE EXECUTION ROOM.

Between the skin and the metal half an inch of absorbent cotton or folds of linen is to be interposed to prevent actual contact. A rubber cap over the head will contain a pint of liquid solution to prevent burning.

The foot electroid is a plate of metal about an eighth of an inch thick and about fourteen inches long and two inches wide. It has at one end an oblong piece of brass one inch by one inch by two inches, in which is bored a hole, so that the connection may be screwed into it. An absorbent substance and liquid electroid will be used as in the head contact. What this liquid solution will be is not yet decided upon. The matter rests with the physicians in charge of the execution.

A heavy strap is to pass around the chest of the criminal, while the legs are fastened firmly to the foot-rest. A flexible cord, which at the same time



MACHINE AND METHOD OF OPERATION.

main building to the new execution building. The apparatus to be used in the stove shop comprises the latest type alternating current dynamo and exciter. This dynamo generates 1.000 volts and gives 1,800 alternations per second at 1,650 revolutions per minute. An adjusting rheostat and ammeter will also be located in the stove shop.

In the large sketch the field shown on the left represents the dynamo. The machine connected with it represents the continuous current dynamo which is used to charge the machine.

The lines connecting the two machines show the circuit leading from the continuous current machine to the field magnet of the alternating current machine. The lines leading from the large machine upon the left represent the main circuit of the alternating current.

In the execution room will be the death-chair, a rack of incandescent lamps to show when the dynamo is at work, a voltmetre to indicate the pressure, switches for closing the circuit, and a Wheatstone bridge for measuring the culprit's resistance before the fatal current is applied.

The chair is of hard wood, and the culprit will s shown in the cut. The knob on the centre head has a hole bored at the top, with a so that the wire can be screwed into it. ttom of the knob is a brass plate, one- of an inch thick and two inches in

o this disc is a No. 9 copper wire, m of a glass spiral and making a r five inches in diameter adjust- r of head.

is a flexible conductor, permits a slight motion of the head, but not enough movement to take the subject outside of the current.

A signal bell communicating between the two rooms is to be provided in order to direct the engineer in the execution room, where the switches for closing the circuit upon the criminal are to be placed. The voltmetre is to be connected by parallel wires to the two main wires carrying the alternating current. The upper wire leads to an ammeter which has been built and collaborated for use on an alternating current, having 290 to 300 alternations per second.

A wire from the meter leads to a switch giving a double break. This wire leads from the switch to the flexible cord attached to the head of the criminal.

From the lower wire there is a connection with the second switch, so that the current may be opened on both sides, and this obviates any risk on the part of the attendants from ground shocks. The second switch has a wire leading to a point where it branches into two flexible connections, one to be brought to each of the criminal's feet.

At the lower right hand corner of the sketch is the Wheatstone bridge, with its galvanometer, resistance coils and battery, and a couple of wires leading out from it which can be applied to the subject in order to obtain his resistance, thus enabling the executioner to know the maximum number of volts that will be required to produce instant death.

The dynamo to be used at Auburn is of the same make, but it is of an older type. It makes 2,000 alternations per minute when at the same speed as the Sing Sing dynamo. The dynamo at Clinton Prison is similar to that at Auburn.

THE CROCKER-WHEELER COMPANY'S NEW SMALL MOTOR.

This company has recently entered the field of electrical engineering and manufacture of machines for electric power purposes of standard construction, believing from their past experience that there is a demand for motors of a high class. They have embodied in the design and construction of their new types, all of the improvements due to their experience, which has been very large and particularly creditable in this kind of work, they having practically initiated the small motor business. Messrs. Crocker & Wheeler are now putting on the market a series of motors which they consider materially advanced in point of strength, efficiency, finish, etc. Their previous success has secured them the backing of strong friends in the organization of their new company.

At the factory, 322 and 324 Seventh avenue, New York, they have collected the latest and

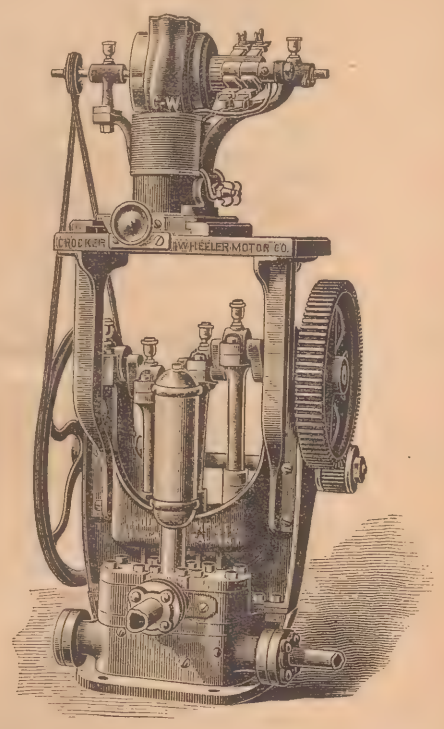


FIG. I.—THE NEW C. W. ELECTRIC MOTOR AND PUMP.

best kinds of machinery for this class of work, and are turning out several sizes of motors, which, judging by their appearance, are scientifically designed and well made. They have just finished the combination of motors of their smaller size (⅛ h. p.) with a positive pressure pump, and we illustrate one of these (Fig 1). The performance of this little motor and pump was a surprise. By means of a system of gears the motor was connected to the pump in such a way as to give it a powerful leverage, and it easily ran the pump under a pressure of 150 pounds, equalling a lift straight up of 300 feet. This pressure was measured by means of an Ashcroft gauge, and was obtained by merely closing the throttle of the outlet of the pump, as it was of course impracticable to actually carry the water to any such height.

Of the desirability and advantages of the electric pump, little need be said, for its application was one of the first uses suggested by electric motors, yet strangely enough, it has been among the last problems that have been successfully solved. In the combination offered, all cumbersome, expensive and disagreeable features of the gas, oil or hot air pumping engines are displaced by a neat and durable motor driving a new type of triple acting suction and force pump. By an automatic

attachment to the ordinary float in the tank electricity is shut off as often as the tank is filled, and started again when partially empty, thereby saving the expense of current supply when water is not drawn. This being entirely automatic, prevents the tank from ever becoming completely empty, and at the same time uses no more current than is required.

The motor is of sufficient power to run the pump for any height of pumping lift and is wound for either of the electric light circuits.

The outfit shown in the cut is the ⅛ horse-

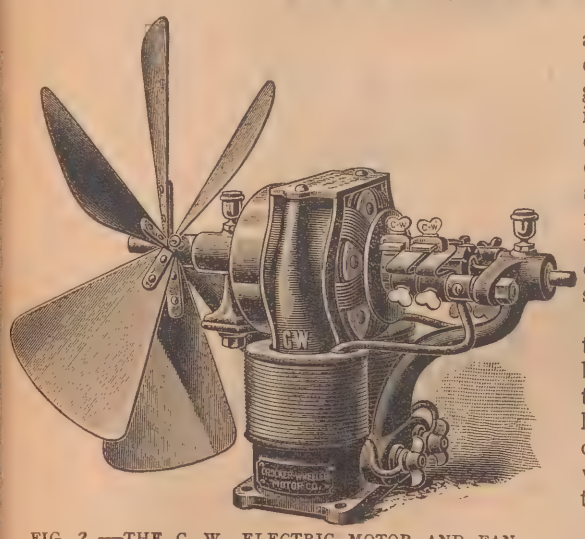


FIG. 2.—THE C. W. ELECTRIC MOTOR AND FAN.

power, which is capable of lifting 1,000 gallons of water per day a height of 100 feet, and other quantities a correspondingly greater or less height. The outfits are sometimes, where desired, provided with toothed or friction gears instead of belts.

The motors are wound for every kind of circuit, and those of different windings are always compared to see if the same efficiency and proportion of ampère turns is maintained. On the smallest size about 2,500 ampère turns are used to magnetize the field, the total loss in the machine due to resistance never being permitted to exceed about 47 watts.

We illustrate also one of the new Crocker-Wheeler arc motors with fan and their regulator, which effects any desired change in the speed and power of the machine, by simply moving the armature out of the field. By this simple device the necessity of any switch, complicated windings and attendant evils are entirely overcome, a matter absolutely essential to the usefulness of small motors.

The motors are built of very few pieces, and are extremely strong and durable. They are designed with a broad base, and the centre of gravity is purposely placed exceedingly low, in order to render them perfectly steady and quiet in their operation. In their care they require a minimum of attendance. These motors are arranged to be controlled by either of three methods of regulation. For constant load, for variable speed and for constant speed, either of which is obtained by attaching the corresponding regulating fixture to the same motor.

The motors are especially arranged so that they can be reversed by simply inverting the brush holders upon the clamping rods so that the upper brushes are placed below, and the lower ones above. By this device the machines can be run either right-handed or left-handed without taking apart or changing any connections.

The Toronto Incandescent Light Co. is operating the Edison system with astounding success. There are some hundreds of orders, booked and unfilled, for the incandescent, to be put in private residences here, and although the company is doing all they can to execute these orders, it will be some little time before they can overtake the demand. The capital of this thriving company is $250,000, which is presided over by president W. D. Matthews and vice-president W. R. Brock; manager and secretary, Frederick Nichols; superintendent and electrician, Wm. E. Davis.

MESSENGER HOLIDAY GREETINGS.

We are prepared to furnish excellent Messenger Greetings, printed on plate paper, at the following prices:

25 copies,	$ 35	500 copies,	$3 50
50 "	60	750 "	5 00
100 "	1 00	1000 "	6 00
250 "	2 00		

Send 2-cent stamp for sample. Address
ELECTRIC AGE, 5 Dey Street, New York.

WASHINGTON, D. C.—Congress is with us, and with it brought the annual message of the President. With the handling of the message there is connected an ambitious desire on the part of the various managements to show up creditably in its handling. The arrangements made by Night Manager W. H. Young, of this office, were complete in every particular. The men selected to receive the message from New York are all of standing reputation. The fine copy turned out by the four artists is a credit not only to themselves, but to the PIONEER of the profession who selected them.

Washington, with but one exception, performed her part of the work without a break. Circuit No. 1, north, was managed by Mr. Denny Brown; it is unnecessary to comment on this gentleman. There adorns (or did at one time) the walls of 195 Broadway a record of his that was enviable. Circuit No. 2, north, was looked after by Mr. J. G. Bickers, a young man who has no superior at the key. His copy was perfect. The cool, calculating, self-possessed "Mike" Cahill held it down on circuit No. 3. This gentleman deserves considerable credit for his good work. After seven hours' steady sending on the inland press circuit, he grasped his pen and recorded with precision the hieroglyphics of his ambitious opponent. The 4th circuit, north, was a roast; Mr. S. L. Dixon, the gentleman who was selected for this wire, has an idea that the whole thing was a *put up job*, and that he was the victim. With a *slip, slap, bang* New York started up; my, but it was a caution. It was Jersey lightning itself. But the complacent smile that overspread DIX's countenance told the boys, that which they all surmised, that the roast was on the other end. While but four circuits north were in use, five south were going, and judging from the grunts and groans emanating from the five individuals who were having the big end of the torment, the circuits were rank. Circuit No. 1, south, was in charge of Mr. W. A. Porterfield, a pretty sender, but the "Bks" he had hardly repaid him for his painstaking sending. Mr. W. F. A. Hassen (late of Pittsburgh) manipulated the key on circuit No. 2, south. All who know him are aware of his uniform and careful sending, but like circuit No. 1, it was "Bk, Bk," Mr. P. E. Brown, one of the fastest and most accurate senders, tried hard to please the artists of the South, upon circuit No. 3 but rt was ditto. Mr. J. H. McEvoy is of the impression that circuit No. 4, south, was not composed of the cream of the profession; like the three preceding circuits, it was "Bk, Bk." Mr. H. D. Robinson had charge of circuit No. 5, south; like the little boy, ——— ——— ———, he has nothing to say. Barring all the slight interruptions, the entire message was handled creditably and in good season. Referring to Buckey's communication of Nov. 15th, wherein I am handled roughly by the Cleveland correspondent, he will be satisfied to the fullest extent of my ability in your next issue as to his presuming and self-inflicting criticism. He has demonstrated two facts; first, that he evidently belongs to the Bowery or Chatham street gang; second, that he is one who jumps at conclusions on suspicion that he has the facts to sustain his conclusions; while, at the same time, he gives additional polish to that which he attempts to tarnish. In closing this letter, let me not forget Willie Parker, our janitor. He extends to the profession (as is his custom yearly) a Merry Christmas and Happy New Year. Willie says: "I'se gwine to hab de turkey and de apple sas and 'spects all ob de boys to look after my *'bution* box, fo' what is the ole man gwine to do if his chilun doan look after him." SALUDA.

ST. LOUIS NOTES.—Business at this point continues good. While the personnel of the day force remains, with few exceptions, unchanged, it might in a measure be said of the night force that "old things have passed away; all things are become new." Among the late additions to the night force are the following: W. A. Bell, from Denver; A. S. Brown, Buffalo; P, C. Nowlen, from Orangeville, O.; D. Baer, Chicago; Jno. Wilson, Los Angeles; W. W. Hunter, J. A. Parkinson, Atlanta; W. G. Fleming, Mo. Pac., Sedalia; F. S. Mitchell, Zanesville, O.; H. H. Eckert, from *Post Dispatch;* G. P. Foley, C. M. Sullivan and J. Tracy, from Chicago.—Departures: C. E. Potter, of the day force, to Ass'd Press, Detroit; Fred. M. Schreiner, resigned to go with broker; Geo. A. Putnam and A. C. Crane, resigned to engage in the insurance business; M. J. Goff, to Omaha; Sam. Payne, formerly with W. U., is now with Gaylord & Co., brokers. Way Chief E. R. Githens received the condolences of the many operators in this office who were personally acquainted with his brother, A. W. Githens, an account of whose accidental death at Chillicothe, Mo., recently appeared in the AGE. Mr. C. S. Slaughter has been transferred from the all night to the day force, a change which seems to agree with the "Colonel." T. J. Irwin has recently returned from his home in Canada, where he has been enjoying a lengthy vacation. The many friends of Miss Emma Neslage, of the Wheatstone department, who has been seriously ill for several weeks past, hope for her speedy recovery. We are glad to say that Operator Hanlon, who has been on the sick list, is again at the key. G. A. Miller, who has been lately rusticating in the wilds of Illinois, among the numerous suburbs of Chicago, has resumed the study of Egyptology on the Cairo wire. Mr. P. J. McCarty, who has been pursuing a course of law studies at the Washington University Law School, passed a successful examination recently and was admitted to the bar. It is rumored that a prominent member of the night force is seriously contemplating a like course, with a view to illuminating the field of legal achievement. Mr. F. J. Krumbling, chief operator at the *Globe-Democrat*, recently elucidated for the general public, through the columns of the *Globe*, the subject of physical phenomenon as manifested by continuous work at the key. What Mr. K. does not know about the vibratory effect of the sounder upon the operator's tympanum would scarcely pass muster. Mr. F. W. McMonnies, son-in-law of Night Wire Chief S. B. Fairchild, was recently awarded the contract for the erection of a statue of Nathan Hale in Madison Square, New York. The acceptance of Mr. McMonnies' design over many competitors was a gratifying honor to a promising young artist. The excellent manner in which the President's message was handled by this office elicited the praise of the daily press upon the quality of the service, which was first-class in every particular. The work was performed under the personal supervision of Chiefs Topliff and Spencer, the receiving operators being Messrs. Harry Eckert, Valandingham, Roberts, Geo. Goodwin, Johnson, Magill, Grandy and Rocke, each taking nine copies. The message was relayed to Kansas City by Operators Campbell, Groves, Ward and Bell, "30" being sent just three minutes after it was received on the New York circuits. Operators Hunter, Morgan and Powell also relayed the message to Galveston, Dallas and Little Rock. It is enough to say that the performance reflected great credit upon the office and is a source of gratification to all. Mr. J. H. Gallagher, the retiring correspondent of the AGE, wishes to thank the management and the operators generally for the many courtesies shown him in this connection. He still retains a lively interest in the AGE and bespeaks for it a more earnest and cordial support than has been bestowed in the past.

NEW YORK TELEGRAPH CLUB.—President Geo. E. Holbrook is in receipt of many excellent letters of acceptance of honorary memberships of the club, all of which we propose to publish. Among the first to arrive were the following:

My Dear Sir :—It is an exceedingly grateful compliment to me to be remembered and thought worthy of honorary membership of the Telegraph Club. First agreeable occupations are like first loves, they possess a charm of their own, and above and beyond all I like recognition as a telegraph messenger boy and a "sound" operator. Therefore I am deeply touched by your action, and I wish I could be present at some of the ceremonial meetings of the club. Meanwhile "73" to all.

Yours fraternally,

ANDREW CARNEGIE.

Dear Sir :—Replying to your telegram of this morning, yes sir; I do accept the honor with thanks, for being so kindly remembered and with gratitude toward my New York friends for the honor. I had hoped to be with you to-night, but I can only sit by the fireside and wish you all long life and a merry time.

W. J. LLOYD.

Your favor of the 2nd inst. announcing my election to an honorary membership in the New York Telegraph Club is before me.

To receive such recognition from your society comprising, as it does, the foremost telegraphers of the United States, is an honor which I assure you is most heartily appreciated and gladly accepted. Yours very truly,

GEORGE H. USHER.

Dear Sir :—I beg to acknowledge the receipt of your favor of the 21st, informing me of my election as an honorary member of your club.

Please convey to the club my sincere thanks for the honor thus conferred.

My address in this city is at the agency of the Nevada Bank of San Francisco, No. 62 Wall Street. Very sincerely,

JOHN W. MACKAY.

My Dear Sir :—I beg to acknowledge receipt, with pleasure, of the certificate of membership of the New York Telegraph Club.

Please convey to the club my best thanks for the honor they have conferred on me. I believe the establishment of this club is one of the best things the profession has ever done. Properly arranged and discreetly patronized, it cannot but prove beneficial to both its members and their employers. I wish it every possible success. Faithfully yours,

GEORGE G. WARD.

Dear Sir :—I beg to acknowledge receipt of your letter of 19th inst., which Mr. Edison has read. He states that he will be very pleased to attend the first annual dinner of your club, but would prefer that you should not organize this with any particular reference to himself. He would like to attend simply in his capacity as a member of your club, and asks you to kindly arrange the matter in that way. You, of course, understand his objection to speech-making, or rather his inability to make a speech. He says it will give him a great deal of pleasure to meet the members of the Telegraph Club on the occasion in question.

Yours very truly.

A. O. TATE, *Private Secretary.*

Dear Sir :—Grateful for the good will that prompted my election to honorary membership, I accept not only the honor, for which I thank you, but also the duties and obligations. My views respecting the necessity for the existence of the club, its present and prospective usefulness and the good that it will generally do, are so well known, that I need not repeat them in this letter. Nothing gives me greater pleasure than to be with the boys in whatever tends to their welfare, and it shall be my aim to promptly answer every call.

Respectfully and fraternally,

W. J. DEALY.

Dear Sir :—Your favor of the 2nd inst. should have been acknowledged at once. The honor you have done me I gratefully accept as a token of good will. I wish your body great usefulness and prosperity, and to yourself happiness and peace. Yours very truly,

JAMES D. REID.

Dear Sir :—I have the honor to acknowled[ge] receipt of a certificate signed by the officers [of] your club, showing my election as an h[on]ary member thereof, and entitling me [to] privileges. While I fear it will not be [in] cable for me to avail myself of such [a] as I would be glad to do, I highly [ap]the honor, and desire to expre[ss]

you, to the members of the club, my grateful thanks for their action in my behalf. Wishing for the club a useful and honorable career,

I am, yours very truly,
A. B. CHANDLER.

Dear Sir :—Yours of the 2nd inst. came during my absence. I thank the members of the Telegraph Club for the honor conferred in making me an honorary member of the club, and forward you this letter as my formal acceptation of the membership in question.

Fraternally yours,
WALTER P. PHILLIPS.

A picture the like of which, in point of artistic effect and uniqueness of design, never before adorned a place in which operators are accustomed to assemble, is now to be found upon the walls of the reception room of this club. Viewed from an artistic standpoint, the workmanship and skill displayed in arranging the various subjects is superb. Above the figures 73, which contain the photographs of 62 active members of the force is a magnificent specimen of scroll work, on which are the words "Cleveland Western Union Telegraphers, 1889." A pole showing an eight wire cross arm on top, and several others of greater capacity beneath, occupies a position of prominence on the left, while on the extreme right a most beautiful marine view is unfolded to the eye of the observer. A square, in which are to be discerned among others, the features of the veteran batteryman Thomas Callahan, occupies a place directly above that of the genial superintendent E. P. Wight, surmounted by the chief and assistants. As a work of art—to say nothing of the affectionate regard manifested by our esteemed friends in the Buckeye State—it is one to claim the admiration of all. President Holbrook, who at the next meeting of the Governing Committee on the 18th inst. will formally present the picture to the club, has already acknowledged to Mr. Isaac Morris in one of his characteristic messages, his acknowledgement of the compliment paid to the members of the club he has the honor to represent.

We are indebted to Mr. O. Moll of London, Eng., for a handsomely bound book of diagrams of the system of telegraphy now in vogue in that country, as well as for an "Electrical Trades Directory and Handbook for 1889." Mr. Moll while on a visit here was shown through the rooms by one of our most distinguished honorary members, Mr. W. J. Dealy. So favorably impressed was the gentleman with what he saw that immediately upon his arrival in London he forwarded by return steamer the above mentioned volumes.

Messrs. Frank J. Higgins, J. M. Sherwin and E. T. Burrill have resigned.

Messrs. Charles P. Burch, president of the Magnetic Club, and one of the best known young men in the profession in the country; Thomas E. Fleming, secretary of the Telegraphers' Mutual Benefit Association; John Ashhurst, chief inspector of electric signals on the New York, Lake Erie and Western Railway; James Keegan, manager of Suffern, N. Y., and Frank Wood, of 195 were elected to membership at the last meeting of the club.

The artistic manner in which librarian Powers has rearranged the hanging of pictures in the various rooms of the club delights the eye of every member.

To our esteemed honorary member, Mr. Andrew Carnegie, your correspondent, in behalf of the 300 members of the club, returns thanks for the handsomely bound volume by Major J. O. Kerbey, entitled "The Boy Spy."

Secretary Watts, who as chairman of the Committee of Arrangements for the purpose of getting up our first annual reception this winter, has demonstrated his fitness for the position by the indefatigable manner in which he has thus far discharged the duties devolving upon him.

It is to be hoped the members will be punctual in their contributions to the library. There will room for several volumes. Those not what to select are respectfully invited to send to librarian Powers at least 75 cents, with which sum he will cheerfully see that no volume in the case is duplicated.

AN ELEGANT CHRISTMAS PRESENT.—A copy of Terry & Finn's second edition "Illustrations and Descriptions of Telegraphic Apparatus." Send one of these books to the person to whom you desire to return a favor, and it goes without saying that it would be a most acceptable gift to the recipient.

FOR RELIEF OF OPERATORS.—Senator Morrill, of Vermont, introduced in the United States Senate, on the 10th instant, a bill to provide for the relief of telegraph operators during the war, who, although not performing strictly military duties, were imprisoned, and who have received no recognition for their fidelity. The bill provides that the Secretary of War, upon application of such surviving operators, shall issue a suitable certificate of honorable discharge, reciting the character of their services, and that they shall receive an allowance equal to or approximating the pay of one month at the time of discharge.

Mr. Geo. Kennan, the distinguished lecturer, who is a well-known ex-telegrapher, closed a successful lecturing season in Brooklyn recently.

Mr. Kennan told stories of the Siberian political prisoners, which filled his eyes with tears and made a profound impression upon the audience. In reply to some questions he read an article by Mr. Marvin, the English writer on Russia, in which it was said that the *Century Magazine* was to be found in many houses in St. Petersburg, and that all Mr. Kennan's articles on Siberia in the *Century* had been read by the Czar himself, and that many minor Russian officials were in sympathy with Mr. Kennan's views.

At the close of the lecture, Postmaster Hendrix moved a vote of thanks to Mr. Kennan in a graceful speech and the motion was seconded by Gen. Horatio King, who said that the name of Mr. Kennan belonged in the high roll of great American explorers and of friends to humanity.

Mr. Wilbur Adkins, who for the past four years has ornamented Louisville's society with his wit and general good nature, goes to St. Paul to take a position upon the *Daily Globe* of that city, as the representative of The United Press. During Mr. Adkins' residence in Louisville he made many friends, both in social and business circles, and when he leaves for his new field of labor, he will take with him their best wishes.

The telegraphic fraternity of Newton, Ks., under the auspices of the O. R. T., gave its second annual ball and banquet, and it was a brilliant success. The fraternity of Central Kansas was well represented.

Mr. John Doran, the well and favorably known private secretary to manager Dealy of the Western Union, has accepted a similar appointment with president Chandler and vice-president Baker of the Postal Telegraph-Cable Company. Mr. Doran acted in the same capacity for these gentlemen when they were at the head of the Atlantic and Pacific Company many years ago.

In addition to Mr. Lynch, who is to work the recorder on the new Western Union cables at 16 Broad street, Mr. J. N. Webb, of the Anglo-American, Valentia, Ireland, has been engaged in a similar capacity to be located in New York, and Wm. White, of Ballinskilligs is to be located at Canso, N. S.

Mr. L. V. Pierson, of the W. U., Chicago, has our sympathy in the death of his mother, which occurred in this city a few days ago.

IGOE-MILES FUND.

The fund started by the Associated Press for the relief of the families of James F. Igoe and Wm. E. Miles, Associated Press operators, who lost their lives in the Minneapolis *Tribune* fire on the night of the 30th ultimo, has, at this writing, reached about $3,000. Among the principal subscriptions were the following:

San Francisco,	$500
Mail and Express, New York,	250
Erastus Wiman, New York,	200
New England Associated Press,	250
New York *Tribune*,	100
" *World*,	100
" *Staats Zeitung*,	100
St. Louis *Post-Dispatch*,	100
" *Globe-Democrat*,	100
Two Baltimore papers,	100
Geo. Washington Childs, *Philadelphia Ledger*,	100
New York office Associated Press,	115

The members of the Minneapolis Board of Trade subscribed $1,000 for the family of Mr. Igoe. This is not included in the sum first named. Mr. Igoe was formerly in charge of the wires on the floor of the Board of Trade, and made many friends.

The St. Paul Press Club has also started a subscription, which, in addition to other independent funds, will increase the general fund at least $2,000, making the grand total to date about $6,000.

PHILADELPHIA POSTAL NOTES.—The short life of some of our messengers is most vividly portrayed thus: Monday, hired; Tuesday, tired; Wednesday, fired. Among the new faces is that of Mr. A. C. Crawford, of the W. U., who relieved Mr. W. G. Harrison; Mr. Harrison having secured a more lucrative position with a broker. Mr. H. R. Glassick, of York, Pa., and Mr. J. P. Hyatt, of Wilmington, Del., favored us with a visit recently. After an illness of more than three months, Mr. Edwin P. Stair, of the sugar district, passed away. Among the most conspicuous of the many beautiful and suggestive floral emblems was that contributed by the telegraphers. Mr. John R. Irwin, of "P" office, Messrs. Leo Miller and Harry G. Storch, of "C F" office, and Mr. James M. Crawford, formerly of "C F," acted as pall-bearers.

PHILA. A. D. T. NOTES.—Messrs. Ed. Kearnes and W. I. Dougherty, of the "4th," are making their duties more agreeable by taking the day and night trick alternately each week. Mr. A. Griffith, night manager at the "3d," has been transferred to the "5th," *vice* W. H. Wakefield, resigned. Mr. J. Spence has been appointed night manager at the "3d" in Mr. Griffith's place.

TRANSFERS.—A. C. Wark, San Francisco to Los Angeles, Cal.; Geo. F. King, Helena to Anaconda, Mont.; W. P. Morgan, Darlington, Wis., to Ontonagon, Mich.; L. D. Gaskill, Kansas City, Mo., to South Columbus, Ky.; J. E. Forney, Hodges to Trenton, S. C.; A. V. Johnson, Nashville, Tenn., to Sheffield, Ala.; D. L. Quaill, Rassean, Ont., to Orillia, Ont.; J. F. Weissinger, Blackville, S. C., to Savannah, Ga.; M. J. Goff, St. Louis, to Omaha, Neb.; G. W. Hammell, Manning to Sumter, S. C.; H. C. Allison, Chattanooga, Tenn., to New Orleans; J. E. Bell, St. Paul to Watertown, Dak.; P. A. Cook, Vancouver, B. C., to Tacoma, W.

The Electric Club of Brooklyn, consisting of New York City and Brooklyn telegraphers, is to give an entertainment and reception at Johnston Building, Flatbush avenue and Fulton street, Brooklyn, Friday January 31, 1890. It will consist of first-class talent. Tickets 50 cents, admitting gentleman and ladies, can be secured from any of the members, or at any of the prominent telegraph offices.

The friends of Mr. W. E. Williamson, now of San Francisco, will regret to learn of the death of his wife and child, which occurred the 20th ult.

BORN.—To Mr. and Mrs. J. J. Corrigan, Cleveland, Ohio, a son, second edition.

UNION PACIFIC OMAHA NOTES.—The telegraph business of this system has been steadily increasing for several months, necessitating a number of additions to the forces of the larger offices and the construction of several new wires. Bad weather has also been with us and has given us several severe roasts. A duplex to Cheyenne, single wires to Kansas City and Chicago, and several way wires are stacked up all day and seldom cleared until late at night. At Headquarters, Omaha, are found: Superintendent of Telegraph, Louis H. Korty; J. B. Sheldon, manager, and the following operators: W. E. Travis, W. G. Ingram, M. H. Brown and Miss Annie Vapor, days; F. A. Secord and C. L. Pond, split tricks, and J. H. Irwin, night man. John Maher is at the division superintendent's office; E. J. Higby, days, and W. H. Staley, nights, at yard master's office; J. Colter, days, and F. King, nights, at the shops, and N. Crenshaw at the local freight office.

ERIE RAILWAY NOTES.—Tom Clark transferred from Passaic Bridge to Tuxedo, nights, in place of Mr. Walsh, who has left the road; Mr. S. J. Traynor, from Middletown Summit, takes the place vacated by Mr. Clark; Mr. Fitch takes the place vacated by Mr. Traynor; Mr. Frank Florence is at Middletown Summit, days; J. Noxon is again at "Q. X." nights, in place of Mr. Feeney, transferred to extra list; Mr. Conolly, of Goshen, has been subbing at Jersey City, and Mr. Weatherly from Weehawken to Jersey City. Mat. Thompson has been subbing at Weehawken, and John Winters at Allendale for Sam. Hunter. Chas. Shandy has been at Southfields in place of Mr. J. Robinson, who has been at Hampton for J. McVeigh, who has been visiting in Pennsylvania. Mr. Prince is at Rutherford, nights. G.W. Doell, of East Paterson, has perfected an ingenious automatic draw-head and coupling apparatus for freight or passenger cars; it works to perfection. He has also made three diminutive cars with which to demonstrate the practicability of the equipment. Mr. Horton, of Ridgewood Junction, held a musical and literary entertainment at the Saddle River Home Amusement Club, recently, which was largely attended and which was a decided success. We extend our sympathy to Mr. McAuliffe, of Ridgewood, whose father died recently at Kingston. The interlocking signals at the junction of the Main Line and Newark Branch are nearing completion and will soon be ready for operation.

KANSAS CITY W. U. NOTES.—Changes since last letter—Arrivals: Lehr, from Cleveland, O., W. U.; Miss Forbes, from Louisiana, Mo., W. U., and Mrs. Wadsworth, from Cleveland, Ohio. Departures are: Keeler and Kennedy, gone south, and P. Keating, formerly in the Wheatstone department, gone with the French Cable Co., New York City. W. E. Jones has returned from his wedding trip, and is now on the 8–5 force. Miss Mattie Van Ausdale has been transferred to the Wheatstone department. W. R Mitchell has been transferred from the 8 to 5 to the 9 to 6 force for the winter. The president's message was handled in very good shape, Messrs. Chas. Harris, Coady, B. Hannon and Frank Williams were the receivers. It was sent on the Western side by Bader, Flynn, Higgins, Evers and Tindall, and was all cleared up by 8.30 P.M. Operator at Kansas City (sending report on Southern circuit), "Particulars of a terrible accident, by which several people lost their lives, and a house was blown to atoms, have just reached——"

Operator at other end: "Break, break," (holds key open a minute) "say, call your chief and get that place fixed—I can't find any such place as Atoms in the tariff book, or on the map—must be a mistake."

Kansas City operator is carried out in a faint.

WINNIPEG NOTES.—The following are the changes: J. J. O'Callaghan and A. N. Wilson, transferred to Port Arthur and Medicine Hat, respectively. F. B. Scott arrived from Wolf River. Business here is good, all the wires being taxed to their utmost capacity. It is rumored that great improvements will be made to the office next month, in the shape of substituting steam heat in place of stoves, bathrooms and everything for the convenience of the staff, and we hope to have one of the snuggest offices in the West. This ought to be an inducement to keep good men here. We were favored with a visit from Mgr. C. H. Myers, of Ottawa, a short time since. He carried back with him a partner. Best wishes to the happy couple. Mr. Frank Revell, one of the oldest and most popular agents of the C. P. R., has resigned the agency at Manitou, for the purpose of accepting the management at Brandon for the Great Northwestern. Mr. H. J. Foote has retired from the agency at Portage La Prairie; his successor, however, Mr. N. F. Snider, is a hustler, and the company has reason to be proud of having secured the services of so efficient an agent. Report of a very unfavorable character is received from Vancouver, stating that five of the best men there had suddenly left on account of some local trouble. We hope that the boys are comfortably settled elsewhere. We regret their departure and wish them well in their new abodes.

BOSTON NOTES.—The Boston fraternity have been getting quite a *roast* recently: the Lynn and Boston fires made things very *hot* in and around the Hub. The President's message, coming about the same time, made the rush of business equal to, if not greater than that of midsummer. Boston, however, is always equal to such emergencies, and on this occasion acquitted itself most creditably, notwithstanding having sent a delegation to Lynn to handle the rush of business there caused by the fire. Shortly after the breaking out of the Lynn fire, the W. U. office there was destroyed. Assistant Superintendent C. C. Bedlow and City Inspector F. T. Viles, with a corps of linemen, proceeded to Lynn, and set to work energetically in securing a new location and restoring connections. This was no easy matter, as the flames frequently retarded their efforts; business, however, suffered but very little delay. The Lynn office is in charge of Miss M. J. Nutter, assisted by Miss Maud E. Cushman, both very popular ladies, and the calmness and fortitude they showed under this trying ordeal were commendable. Doubtless the assistance and association of the quartette of Boston experts sent to help out tended materially to alleviate the difficulties due to the fire, and to enbance the geniality of those ladies. These gentlemen were E. B. Elliott, H. C. Wolever, Dan McCarthy and H. A. McDonald; their names are sufficient testimony of the expediency with which the large amount of business was handled. All connections had hardly been restored at Lynn when Mr. Viles was called home to attend to a similar emergency in his own department. In the building in which the Boston fire originated was "He" office, one of the largest branch offices of the city. The building, though a large one, seems as if it had melted, so little is left of it. Manager Tobin saved his books, records and cash. "He" business is now being temporarily done at "Cy" office, in the dry goods district, until the new Shoe and Leather Exchange is completed, in which the office will be permanently located. The recent fires have given rise to considerable discussion among the fraternity here as to the probability of a fire occurring in the W. U. building, and what the consequences would be. It is the commonly expressed opinion that a fire, once fairly started, would, in a short space of time, demolish the building. And as the means of egress are by no means the best, it is an open question whether or not all would escape unscathed. At about 5.30 P.M., when the day force are going off and the night force coming on, the stairway seems taxed to its utmost at times. What it would be in case of a panic would depend on the imminent dangers, and several say they would rather risk the stairway than trust to the present fire-escape. The President's message began to arrive about 1.15 A.M., and was all cleared up at 4.15 A.M. Messrs. Clinch, Shirley, Cooper and Brown were the quartette selected by Night Manager Pond to handle the message; their work was very creditable, though being obliged to copy it on 17 sheets of manifold. The meeting of the Mutual Aid and Literary Association held on Sunday, December 1st, was an interesting one and largely attended. The annual election of officers took place, and resulted as follows: President, Robt. E. Tobin; Vice President, M. C. Harrington; Recording Secretary, Geo. H. Winston; Financial Secretary, John A. Kenna; Treasurer, H. W. Gillespie; Sergeant-at-Arms, Daniel Carter. This is the old board re-elected. Arrangements are being rapidly pushed forward for the annual ball, which is to take place on February 14th. The marked successes of these annual entertainments have reflected considerable honor on the Boston operators. It is hoped that the coming event will have the hearty co-operation, individually and collectively, of all who can assist so good a cause.

DETROIT NOTES.—Thanksgiving Day in Detroit was not altogether a success, at least so it seemed from the telegrapher's standpoint. The storm of the preceding forty-eight hours had tangled up things generally to such an extent that it was deemed necessary to keep a full force on hand to look after the delayed business. There was a general offering up of everything except thanks, as the deluded operators wrestled with a heavy escape, instead of the festive turkey. "Three hours for dinner," when announced, however, had the effect of partially restoring good humor. . . . . Dr. Alf. Lowther, who has been doing the "solitary" the last month, has gone to Toronto to join his wife, and will also take a short vacation. The "Dr." can stand the rest, as he has to hump largely, to take care of a flourishing dental practice, besides working a night trick at the office. George Singleton has returned from Northern Michigan, where he has been engaged in the lumber business during the past six months; he expects to return there in the spring and is subbing for Mr. Lowther during the latter's absence. The President's communication was gathered in by Messrs. Avery, Finn, McMillan and Smith, and was turned out in good style. Three recent arrivals are: Mr. P. V. Williams, from Lansing; Miss Depew, Bay City, and Miss Nolan, from East Saginaw, where she has been doing relief duty. Miss Anna Keefe has been temporarily transferred from Detroit to East Saginaw to act as bookkeeper there pending the appointment of a permanent man for that place. Some misguided individual undertook to write up the W. U. office in one of the city papers a Sunday or so ago. He made out that one of our nicest girls weighed several pounds more than she really does; that the head of another member of the force had evidently gotten several years the start of the rest of his body; that another was so thin he couldn't make a shadow on the sunny side of the street. All this and much more in the same malicious vein, reading like the description of a dime museum, and there was blood on the moon for a few days, but the villain has escaped violence thus far.

The operator of a Pittsburg electric car r
versed the currents very suddenly several d
ago, and the iron work became so h
charged that two passengers received
shocks.

Mr. J. D. Reid has arrived in Lon
he will remain for a week, when
ceed to Dunfermline, Scotland.

THE PRESIDENT'S MESSAGE ON THE ASSOCIATED PRESS WIRES.

From time immemorial, telegraphically speaking, it has been the ambition of all operators concerned in the handling of the president's annual message to Congress, to excel all previous records for first-class work, and win for themselves exceeding renown and glory. The Western Union Telegraph Company, particularly, have performed some remarkable feats on these occasions. But their achievements have been remarkable more in their ability to rapidly dispose of a long document entire, on a large number of wires, rather than high speed on few wires. In the past few years, however, the Associated Press has been handling the president's message on its own wires, when practicable, and surpassing all previous records.

On the occasion of President Harrison's first message, on the 3d instant, the document was transmitted from New York, by the Associated Press, to all the principal western cities, over its two leased wires in a manner it is thought never before equalled. There were 15,000 words in the message, and it was transmitted on the two wires in 3 hours and 40 minutes. This is a speed of a trifle over 34 words per minute on each wire.

The matter was copied on type-writers at all points, and the work was so skillfully performed that many editors bestowed deserved praise upon the service in their columns. Considering the extent of these circuits, embracing the principal cities between New York and Minneapolis, Minn., this performance is excellent.

The following are the names of the operators, at the different points, who handled the message: New York, G. F. Allman and P. T. Brady, senders; Pittsburg, H. W. Orr and Eli Paintor; Cleveland, E. W. Baum and C. W. Heaton; Cincinnati, receivers, C. J. Christie and J. B. Watt; senders on southern circuits, A. E. Rose and E. W. H. Cogley; Detroit, Robert Berry and C. E. Potter; Chicago, H. Collins and Mr. Hayes; Milwaukee, E. B. Duffy and Edward Hickey; Memphis, W. H Bear and C. S. Weaver; Nashville, T B. Coppedge and G. M. Hewes; Louisville, F. B. Williams and J. W. Hust; Indianapolis, L. D. Stanley and Vet. Wilson; St. Louis, F. H. Lewis and George Bacon.

CHICAGO W. U. NOTES.—The case of Malcolm Doyle, an operator, formerly of this office, is attracting much attention here, who, through the influence of a soldier, enlisted in the United States Army about two years ago at Ft. Custer, Montana, and after six months' service, deserted, and who now has surrendered himself to the authorities at Buffalo, N. Y. He is now incarcerated at Ft. Porter, awaiting court martial. The operators of Chicago have drawn up a petition addressed to Major General O. O. Howard, commanding the division of the Atlantic, praying for the release or leniency of sentence for the young man. Your correspondent is happy to say that every telegrapher of Chicago signed the petition. While in Chicago, Mr. Doyle made many friends and was very popular, and left an excellent record; and the fraternity with regret hear of his trouble, but hope President Harrison will do justice to this gentleman.

At the next meeting of the Morse Council National Union, there will be an election of officers for the coming year, and the members are holding caucusses among themselves as to who are to be the officers which shows the great interest taken by the members.

On Thanksgiving Night, Chicago Division No. 42, Order of Railway Telegraphers, gave their third annual reception at Martine's West Side Academy, at which there were about 200 couples present, and several from this office attended this brilliant affair. The fraternity of this office hopes that the O. R. T. will send us around a few more invites, as there are at least 300 operators in this office. A unique souvenir was issued by the Division, containing portraits of its officers and popular telegraph

The President's Message was handled in very fine style by Messrs Reinecke, Grant, Fleming, Murphy, Baker, Baldwin, Nelson, and others, whose names could not be learned. Mr. Al. Baker took his first President's Message about twenty-five years ago and almost every year since. The promptness with which it was handled by the above named gentlemen, was highly commented upon.

Mr. Fred. Holden, of the Western Associated Press, has left for Minneapolis, to take the position vacated by W. E. Miles, day operator and agent of the Associated Press at that city, whose sad death is elsewhere chronicled.

Pearson was called home to Philadelphia to attend the funeral of his mother.

Mr. T. T. Childs has been on the sick list for the past week.

Arrivals are Mr. Tyler, from Indiana, Goodwin, Peoria, Ill.; departures, Zechlin to Milwaukee.

PEORIA NOTES.—Since we were heard from last many things have happened in this hustling village of distilleries. Our genial cashier, Mr. Hammatt, has taken unto himself a better half, *nee* Miss Anna Young. We all unite in good wishes to the happy couple. The President's message was handled in fine shape at this point, by Messrs. Baker and Sanderson, and all concerned were very much pleased and gratified by the manner in which it was done. (Mr. Sanderson is a late arrival from Kansas City and relieved C. A. Smith.) The railroad personnel follows: At C., R., I. & P. freight office are B. C. Swane, days, and C. D. Palmer, nights; at shops, Wm. Carney; at T., P. & W. R'y C. B. Plantz is chief despatcher; E. A. Parker first, F. R. Eckard second, and B. A. East, third tricks, with G. C. Knoche as operator. Fred. Cook presides at the freight office. Next in order comes the P. & P. U. R'y, which is a short line between Peoria and Pekin, but to whom all roads, except C., B. & Q. and C., R. I. & P., must look for entrance into Peoria. Mr. J. H. Morrison is the chief despatcher and works first trick, while G. H. Toole and E. M. Flood are on second and third tricks, respectively. At the Bridge Junction, Frank Schunk is day operator, and H. B. Hughes, nights. At O. F. & W., local office, C. A. Hill, and M. R. Cash, at T. H. & P. At J. & S. E., Fred Crane. At P., D. & E., freight office, E. J. Frankenfield, and C. S. Hurd, at general office. At L. E. & W., Mr. P. F. Bunn, and at Central Iowa, E. R. Harwood.

TWO PAPERS IN ONE.—The ELECTRIC AGE will hereafter consist of a complete electrical journal and a thorough telegraph paper combined. This should be incentive sufficient to induce every member of the craft to subscribe. We must of necessity expect a boom in our subscription list and look to our enterprising friends to bring it about. If you have a friend who does not subscribe, or worse yet, who reads your copy, take him to task. Dwell upon the necessity of making the organ of this profession something to be proud of. To be successful, it should contain all the information pertaining to the craft and be an electrical educator at the same time. No one should hesitate about investing $1.50 in its support.

A DINNER TO MR. THEODORE BETZELL.—A farewell dinner was tendered to Mr. Theodore Betzell, at Pelveno's, in East 23d Street, on November 16th. Mr. Betzell has been chief inspector of the Commercial News Department for many years, and has always been held in high esteem both by the officers of the company and his fellow craftsmen. Plates were laid for thirty, and the affair was a grand success. Speeches were made by Messrs. Betzell, Waldron and Chase, after which the diners were treated to some vocal and instrumental music. Mr. Betzell left for the Argentine Republic on the 20th inst. Among those present were: M. Breslin, L. H. De Boies, A. V. Waldron, Chas. L. Chase, F. J. Gormley, P. J. O'Halloran, Chas. Le Bree, C. J. Power, D. Wark, D. A. Foster, E. J. Leary, A. J. Driver, C. H. Foiles, G. G. Small, H. Conrod, Chas. Schwandt, H. H. Sillery and E. B. Van Kuren.

JAMES IGOE, WHO WAS KILLED IN THE MINNEAPOLIS FIRE, WAS A PENNSYLVANIAN.—James Igoe, the operator who was killed by a fall from the telegraph wire by which he was trying to escape from certain death in the Minneapolis *Tribune* office at the time of the fire, was a Pennsylvanian. He was born in Ashland, Pa., thirty-two years ago. He has been an operator all his life, his first work being done for the Philadelphia and Reading Railroad. During the Exposition at Philadelphia, in 1876, he was one of the operators stationed there by the Philadelphia and Reading Railroad. He went to the Northwest about twelve years ago, and engaged with the Manitoba Railroad. For some time he worked the St. Paul end of the *Globe's* special wire to Chicago. He was also for some time chamber of commerce manager in Minneapolis for the North American Telegraph Company. He began work for the Associated Press about two and a half years ago. Wherever there are telegraph operators in this country Igoe was known and well-liked by every man who ever knew him. He was not only a first class operator, but a first-class man. He was honest, straightforward and well-meaning as a man could be. He had worked all his life as an operator, and the wires which he was wont to control with a touch as light as that of the most skillful pianist were the means of his death at last. Igoe leaves a wife and four small children, the oldest not over eight years of age.

ADDRESS WANTED.—Would like to have the address, or information, of Robert Steedman, operator. Took night report at Wichita and Topeka, Kansas, about a year ago. Personal matters. Please reply to the AGE, or to B. C. Elder, care W. U. Tel. Co., Kansas City, Mo.

Mr. John F. Agne, an old-time operator, has been appointed Clerk of the Auburn, N. Y., Prison, an excellent position. Mr. Agne acted as assistant clerk for some time and became exceedingly popular among those with whom he came in contact. He also spent many years in the telegraph harness and made lasting friends of all those he met. He was in the 195 Broadway office until the strike. He procured a place with the Postal Company, where he remained for a short period, when he accepted a position with a bank in Rochester as teller. Aftor five years of faithful service as teller, he received this appointment, and it goes without saying he will maintain, if not excel, the previous good records of the Empire State's prisons. All Mr. Agne's friends unite with us in extending him hearty congratulations, and at the same time the State is to be commended for the excellent choice it has made.

Married—Mr. Minor M. Davis to Miss Minnie B. Smith, on December 5th, in Brooklyn, N. Y. Mr. Davis is assistant electrician of the Postal Telegraph-Cable Co. and an exceedingly popular and rising young electrical expert. The happy couple were the recipients of many beautiful and costly presents, in addition to the congratulations of a host of friends and well-wishers.

The *Weekly Telegrapher*, the official organ of the Order of Railway Telegraphers, of Vinton, Ia., makes its appearance December the 1st in a neat and convenient size, in fact the same as the ELECTRIC AGE has been for some time past. It makes a handy sheet to save and bind, and the move on the part of the publishers of that journal is in the right direction. It also has a cover, distinctive in color, making the entire paper an ornament.

If our Chicago friend who wrote the article printed in November 16 issue in regard to every man having a mania for writing poetry at one period of his life, could have seen the stack of poetry sent to Mr. Reid before he left this country, he would have emphasized his assertions more strongly than he did.

OUR PRIZE STORIES.

No. One.

CHRISTMAS EVE.

Iza Hillson is at her desk, in the Western Union Telegraph Office at Avondale.

She is thinking, thinking of a chat she has had over the "wire" the day previous, with a certain gentleman operator at Elmwood.

Her pleasant thoughts are interrupted by Chief Operator Brown handing her a letter.

He smiles and looks curiously, first at her, and then at the letter, as it is not usual for Iza to receive her letters at the office.

Inwardly wondering who her correspondent at Elmwood can be, she opens the letter and discloses a small Christmas card, wrapped in a blank sheet of writing paper.

On the back of the card are the words in telegraphic characters: "To A" from "H," "M. W." "M. W." is the "call" for Elmwood office. So the mystery is solved. Iza, laughingly, explains to Mr. Brown that the card is from an operator up the line.

Mr. Brown, after joking Iza about her unseen admirer, turns away to look after the "quads." Iza immediately steps to No. 2 wire, and calling up "M. W.," inquires if it is "H." On being answered in the affirmative, she says, "Say, H, did you send me that pretty little Christmas card?" Otto Thorning acknowledges that he did, and hopes that she liked it. Iza thanked him for it, and after a short chat they say "G. P. M."

Three weeks later Iza is called to the "key." "H" wishes to speak with her.

She steps to the key and signifies that she is there.

"Say, A," begins H, "will you be offended if I send you a small photo?"

"Offended? Why, certainly not," Iza replies; "but whose photo is it?"

"Mine, of course," is the answer, "and," continues Otto, "will you favor me with yours in return?"

"Oh!" Iza says, "I have none of my own at present; but, when I have some taken, you shall certainly have one."

"Thanks so much——"

And just then an office breaks in for business, and their chat is stopped.

Sure enough, what Iza has considered a good joke becomes reality, for three days later she receives Otto's photo. A nice, short note accompanies it asking pardon for the liberty, etc. Iza is delighted with the photo, and suddenly becomes conscious that her "wire" acquaintance has become an object of great interest to her.

Iza writes her thanks for the photo, and thus commences a correspondence. A few months later, after some serious thought, Otto leaves Elmwood for Texas and after being there for a short time, Iza receives a proposal of marriage from him, which she accepts.

One morning she receives a letter postmarked "Texas." It proves to be anonymous, telling Iza that Otto is madly in love with a young and beautiful married woman.

Iza is stunned.

Her heart is torn and bleeding, for she knows not what to think.

She pens a short note to Otto, enclosing a copy of the anonymous letter, and giving him his freedom.

Four days later she receives a telegram:

Lorena, Texas.

Miss Iza Hillson, Avondale, N. S.

It is all false. Am sick in bed. Will write when able. Otto.

What a load is lifted from Iza's heart!

She writes Otto, asking his forgiveness for doubting him.

Harmony was restored once more, and in the following November, 188–, they met in St. Louis and were quietly married.

The truth, Iza afterwards found out, was that this woman was madly in love with Otto, and begged him "for God's sake not to marry Iza, or if he did, she would kill him." Finding that all her art and powers failed to part Iza and Otto, she and her husband went to some town on the frontier to live, and neither Iza nor her husband have heard of her since. And so the romantically brought about marriage terminated happily.

No. Two.

A SKETCH.

- - - - The darkest day,
Live till to-morrow, will have passed away.
COWPER.

From every niche in the dingy little room were festoons of fine lace-like webs. From every object above the corner, where clicked at intervals the wheezy old sounder and piping relay, was suspended the same lace-work. The most beautiful patterns were there of exquisite make, rare, but not costly.

That corner! No other on this continent—or any other—could be designated by the name of "That Corner." Of all the dreariest, darkest, dirtiest bits of room that was the one over all others. No one dreamed of having it otherwise.

Outside the one small window, with its narrow sills, smoky panes of glass, and the creaking old shutters, thickly covered with the accumulated dust of bygone years, the wires were wailing beneath the burdens they carried, from ocean to ocean, and shore to shore, stories of death and destruction everywhere. While over all, unceasingly, steadily, fell the cold December rain.

Miserably worked the wires; and with each labored, fitful start, as though some hidden imp delighted in giving an additional twinge to the already worn-out spirit of the man at the key, there rose a shriek from the moaning winds as of a dying comrade, whose soul could not find the rest it craved.

"Brother," cried the youth, "or is it a sister-spirit," and here the whole face looked the strain the long night's work had stamped upon it. "Can you not tell me when my time, too, will come to join those to whom the grave has made division, absent, but never forgotten? Am I forever to be here? Is there no place, no room for me, for my friends who work day after day beside me, save in this soul-crushing, heart-breaking sphere, where the brain on fire and throbbing brow, only finds on every side, hours and calls, tricks and subs, reliefs and breaks, a dot and dash, with seldom, if ever, a tithe of cash?"

And in the magical change of one short half hour, with the sweet blue sky, the vanishing of all dark, dreary clouds, the golden sunlight streaming into the bare, bleak corner, brightening all it touched, came the answer to the poor, overburdened soul, in the softest, gentlest whisper of the wind, side by side with the singing wires, carrying their messages of Joy and Love and Peace:

"We all must work below,
But there is rest above.
It is Hope that is the leaven;
And this roseate glow
Springs from the one word Love.
I make answer, Yes, in Heaven."

At the last regular meeting of the Telegraphers' Chess Club, November 11th, the following were elected as officers for the ensuing year: President, J. H. Dwight; Vice President, F. W. Baldwin; Treasurer, J. Brant; Secretary, D. C. Donohue. The annual tournament of this club commences December 9th, 1889. As several handsome prizes are to be awarded the winners in their respective classes, a spirited contest is anticipated. Membership from among the craft is cordially solicited.

BRAVE TELEGRAPHERS.

OPERATORS MILES AND IGOE, OF THE ASSOCIATED PRESS, MINNEAPOLIS, BURNED TO DEATH.

James F. Igoe and Walter E. Miles, night and day operator, respectively, of the Associated Press, Minneapolis, were burned to death in the *Tribune* Building conflagration on December 1st. Late on Saturday night Mr. Wm. D. Chandler, who was sending Western press matter from the New York office of the Associated Press, was interrupted. Operator Igoe at Minneapolis had "broken" and all the men on the "line" had paused, like Chandler, to listen.

"There's a fire on the third floor of the *Tribune* building," said Igoe on the wire, "and I'm on the seventh floor." Then, after a moment's pause, he added: "Go ahead, Chandler!"

And New York began again, and after a brief space yielded to Cleveland, who had a "rush" despatch, and this was all of Cleveland's message that Igoe received:

CLEVELAND, O., Nov. 30.—Capt. Joseph Moffet, a well-known lake man, was killed to-day by falling into the hold of his vessel——

Just there Igoe "broke." "Boys," he ticked on the wire, and there was another brief pause, and all the men on the circuit were listening with interest, for they had noted in the transmission by Igoe of the word "boys" a tremulousness of touch, just as a laymen could detect a tremor in a human voice.

"Boys, I've got to stand you off," came from Igoe. "I'm the only one left on this floor. Everybody is gone, and I can't stay any longer."

Click, shut went his key, and some operator on the line quickly "opened" and shouted after Igoe, as it were: "Take the machine along—save the machine," referring to the typewriter, the Associated Press reports being executed on typewriter at all points. But there was no response. The ticking instrument had ticked its half jocular message in an empty room. Nearby sat the machine and the last item taken, which had been Cleveland's item about a violent death.

Then the work went on again, and no one of his colleagues thought seriously of Igoe's good-by until there came bulletins of loss of life, and among them a bulletin stating the probability that poor Igoe had stayed too long.

Those 200 last words he remained to take were fatal. They cost him his life, and the men at their keys were grave as they worked on to "Good night."

One, who had started in at "Good evening," had received his "30" before the report was closed.

The sight of the sufferings of the burning, struggling men brought tears to the eyes of the bravest, and women prayed and strong men breathlessly watched Operator Igoe's brave attempt to escape. He had got clear of the building and was gradually working his way along the wires to safety, while the silent, prayerful crowds below anxiously and helplessly watched his brave attempt to save to his wife and four little ones their bread-winner. But the wires cut and his strength failed, and a groan went up from the upturned faces far below him when he was seen to slip from his slight support and fall to the roof of the boiler house, where he received fatal injuries. Men lifted him gently and started with him to a drug store, but on the way, after a final word of loving care for his family, he breathed his last.

Mr. Walter E. Miles, night agent and day operator of the Associated Press, while at work in another part of the building, went down with the wreck and was burned to death.

The well-known and popular Eastern electrician Mr. Fred. Catlin, of 195 Broadway, the inventor of a Pocket Chess Board, which is receiving much favorable attention at the hands of the lovers of this game.

NEW YORK WESTERN UNION NOTES.—The last issue of the AGE containing a very graphic account of the scenes and incidents attendant upon the departure of the telegraphers' friend, James D. Reid, omitted mention of the few brief words addressed to him by Mrs. M. E. Randolph, who stood by his side in company with Miss Reiners, and introduced to the bosom friend of the illustrious Morse the ladies as they appeared. This is what she said: "Mr. Reid: We greet you as the gentleman who appointed the first woman operator in our profession. In memory of your services in our behalf so many years ago, in saluting Prof. Morse, we propose to heap coals of fire on your head by saluting you three times. Once for kind memories of the past; once for tender appreciation of you in the present; once for bright hopes for your future. With this triple crown we bid thee God speed in His tender keeping." The day preceding his departure Mr. Reid wrote the ladies above mentioned as follows:

Dear Mrs. Randolph:—I want to thank you very kindly for the unlooked for and I fear undeserved compliment paid me by you and the other ladies of the building on Saturday. All these things stimulate me to be a better man.

With kindest regard, yours very truly,

J. D. REID.

Dear Miss Reiners:—Permit me to use one of my last moments in thanking you for your very kind part in the reception of Saturday. I shall not soon forget it. I have not deemed myself deserving of tokens of regard so marked, and yet receive them very gratefully.

With much esteem, yours sincerely,

J. D. REID.

The new portable electric light lamps that now adorn the desks of night manager Sink and that of his assistant Mr. John H. Dwight, are highly ornamental as well as useful. The new hanging lamp [illegible] Cincinnati [illegible] the Memphis and Nashville quads [illegible] the tendency to reduce by several years the heretofore burdensome existence of Messrs. Smith and Cunningham. Thanksgiving evening and night at the St. Lawrence Roman Catholic Church, 84th street and Park avenue, was presented for the benefit of the poor, the well-known drama "The Time and Hour," in which Fred. Meyers as *Sir Phillip Deverell*, and Joe Van Cura as *Mr. Franklin* made a most pronounced hit. The result of the play was highly satisfactory, and Father O'Connor, the pastor, was unstinted in his praise of the piece and the characters represented therein. Miss Rosie Flynn, of the city department and Mr. Joe O'Connor were married November 27th. Congratulations. There is known to all operators on the Western Ways an operator, in the interior of the State, whose combinations are of such a character that whenever he strkes a red message, to save his soul from Hoboken he couldn't send the check other than——"paid night rats," and as a consequence his reformation is nightly prayed for. The main switch board, thanks to the patience and perseverance of lineman Joe Worzel, has taken on a polish such as it hasn't worn before in years. Mr. C. B. Rittenhouse, it is reported, was a few days ago united in marriage to one of Jersey City's fairest daughters. Under the immediate supervision of chief operator Conrad Meyer, ably assisted by such wisely selected lieutenants as Messrs. Firmin, Robinson, Burrill and McAllister, the presidents' message containing in the neighborhood of 14,000 words was transmitted without a single error or mishap. The operators chosen for the performance of this task were Messrs. Stewart, Rockwell, Smollen and Thompson on the south; Messrs. Backus, Gus Miller, Jennings, Patterson and Kraanshaar on the west; Messrs. Robbins, Edson, Sullivan and Morton on the east, and Messrs. Nace, King, Max Green and Harvey Dutcher on the State. During the absence of Mr. Lounsbury, Mr. Willian Tucker has been temporarily assigned to the Washington quad. Messrs. Bergin and Kraanshaar have been assigned to duty on the south, the latter to give especial attention to Congressional circuits. John J. Murray has returned from a pool room. Miss Minnie Brooks, who works the Detroit quad, accredited herself most highly, and at the same time surprised her many friends by the able manner in which she personated the character of *Dot Perrybingle's Wife* in "The Cricket on the Hearth," which, under the auspices of the Joseph M. Powers Entertainment Company was presented to a large and appreciative audience at Lyric Hall a few evenings ago. W. W. Friend has been assigned to the Syracuse quad *vice* Miss Frazee, mention of whose marriage appeared in a previous issue of this journal. The death of Mr. Gearymore, familiarly known among the force here as "Lucy," fills with sorrow the hearts of all who knew him. Mr. Clampitt, who has returned from a six weeks' vacation spent at his home in southern Missouri, is the picture of health. Messrs. Ashcroft, Lane, McGinnis, Flynn and Horace have been assigned to the split trick. Mr. Morrissey, Forson, Weir, Jno. Green and Sharkey have been added to the day force, and Mr. Wood to the 7:30 trick. Messrs. Fisher, Craig and Kelly have been given the split trick, and Messrs. Donovan, McElroy and McKim the day force in the Wheatstone Department. Mr. McKenzie has been assigned to the 9:30 to 7 o'clock force. E. H. Simmons has accepted a position at Jacksonville. A. J. Heldman of the Louisville quad wears a perpetual smile because it's a boy. Mr. McWha, having concluded his position in a pool room, has resumed his former place on the Pittsburg quad.

PRIZE STORY.

No. Three.

A BATTLE AND ITS SEQUEL.

Some years since, when the W. U. main office was at 145 Broadway, N. Y., among the operators on the "east," was a young man just launching out on the twenties. Knowing his parents and members of his father's family, their high standing in intellect and morals, I sought an early opportunity to form his acquaintance, and we became firm friends.

What follows is a truthful account, given by himself, and I regret my inability to recall full details.

It was in the days when "women as telegraphers" were decidedly unwelcome, and I suspect that my friend, fresh from the momentous act of casting his first vote, felt his importance as one of the "Lords of Creation."

It transpired one day that there was a fierce battle on that eastern circuit, my friend and the young maiden at the terminal station being the principals.

History fails to record the damage to the wire, and how much it cost the company for repairs. Sufficient to our purpose is it to know, that the "blessing" he thought he had bestowed on that young woman was quite insufficient to disturb her complacency or check her usual gaiety of spirit.

He came of a long line of chivalric ancestry. He had a conscience. It prompted him to take a short trip and see for himself what kind of a woman the unsubdued rebel was.

He came! He saw! He conquered! Ah! but he was conquered too! I suspect the record of that wire for the immediate future would reveal no more battles, but instead, buds of hope that blossomed into joy.

A few years later, in speaking of his "home," he said, "my wife, the honored priestess at its shrine, with her lovely but invincible spirit, has made our 'home' a heaven. I have fully won my prize, and in any battle of life she stands bravely by my side to encourage and help me."

The second edition of Terry & Finn's "Illustrations and Descriptions of Telegraphic Apparatus" is now for sale. It is the most complete telegraph work extant, and should be in the hands of every telegrapher who desires to know something of the instruments he operates daily. Simple language is used, so that any one who can read English may be able to solve the problems therein. It is a fit companion and text-book for the craft, and the price has been made so reasonable as to permit of all interested purchasing a copy. Where there are three or four operators in a small office. the amount necessary to purchase a book should be divided equally among them. It will make an excellent Christmas gift, and should meet a hearty welcome by those interested in holiday presents. Price, $1.50. Address ELECTRIC AGE, 5 Dey street, New York City.

Peter Clausen, a lineman in the employ of the North New York Electric Light Company, was instantly killed on the 9th instant while at work on a pole on the corner of Third avenue and 156th street. It is said he received a current of 2,000 volts, and the circumstances of his death were very similar to those of the killing of lineman Feeks, some time ago, on Chambers street. It does not appear that he took any of the precautions required by the rules of electric light companies, such as wearing rubber gloves, etc. He furthermore violated another rule of his company which requires all linemen to stop work before 4 p. m., as currents are turned on at that hour. The accident occurred at 4.20. Why he delayed in stopping work will probably be never known, but by so doing he paid a terrible penalty.

Percy R. Todd, an old-time operator, has been appointed general freight agent of the West Shore Railroad—a well-deserved promotion.

CLEVELAND NOTES.—Our vacation was quite lengthy, but will endeavor to give a few items that occurred while we were absent. Business was handled in first-class style on election night, and every one seemed satisfied. More or less rain for the past two weeks has made many of the operators "out of sorts" at "getting stuck" nearly every day. Miss Skinner has returned after a long absence on account of poor health. D. C. Washington, check boy, transferred to manage a branch office. Departures: Harden, Traverse, McCurdy, Murphey, and Frank Howe returned to St. Louis. Arrivals: Miss Hyland, Miss Chandler, Messrs. Ross, Richardson, Fahey, Maltby and Fiedler. The following was heard on a way wire a few days since, way offioe sending report of political meeting to another way office, coming to the sentence—"Mr. K—— then spoke in his characteristic style, *a la* —— howling success." Receiving operator breaks three times on *a la*. When through, he propounds the query, "Say, does that *a la* mean Alabama?"

MILWAUKEE NOTES.—The unexpected and somewhat sudden death of Night Chief Operator Wm. M. Grange, on Monday, the 2d, has cast a gloom over this office. In our last notes, in speaking of Mr. Grange as "enjoying a much needed rest," we little thought then that it was to be his long and final rest. The patience and fortitude with which he bore up under what must have been a long and trying illness was such, that his most intimate friends were not aware that there was anything serious the matter with him. He never complained or spoke of his troubles, but bore them bravely and unflinchingly until the end, thinking only of his young wife and year old son. This office adopted the following resolutions:

WHEREAS, It hath pleased God to remove from our midst our friend and associate, William M. Grange;

Resolved, That in him we have lost a devoted and kind friend, his family a loving husband and father. That we tender our deepest sympathy to the family and relatives of the deceased in this, their hour of sorrow and affliction.

Resolved, That a delegation of five telegraphers be and are hereby appointed to escort the remains to their place of rest.

The resolutions were drawn by a committee consisting of Emil M. Shape, William R. Barker, William H. Maher and Charles Warth.

The funeral was attended by a delegation from this office. The Milwaukee telegraphers sent beautiful flowers, and floral tributes were also sent by friends of the deceased in Watertown, Ashland and Madison. Mrs. Grange has received letters of condolence from all parts of the country.

DIED.—Charles T. Smith, the oldest of all old-time telegraphers, died December 9, at his home in Jersey City, in the sixty ninth year of his age. He became connected with the telegraph in 1854 on the first Baltimore and Washington line, thus antedating Mr. J. D. Reid considerably. Mr. Smith was a chemist and a very bright man. For many years past he has had charge of the Western Union lunch room, and has not enjoyed the best of health. The funeral occurred on Wednesday evening at 8 o'clock and was largely attended, many persons coming great distances to pay their last respects to the memory of their old friend. He leaves a married son and a widowed daughter. The death of Mr. Smith makes a Mr. Zollickoffer the oldest living telegrapher.

DIED.—On December 2, Wm. H. Grange, night chief operator of the Western Union office, Milwaukee, Wis., of Bright's disease; aged thirty-two years.

If the telegraph operators in the United States and Canada would each contribute five cents to a general fund, what a magnificent monument could be erected by the profession to the memory of J. F. Igoe, the hero of the Minneapolis *Tribune* fire, and to Mrs. Ogle, the heroine of the Johnstown disaster.

The Postal Telegraph Company opened an office at Lockport, N. Y., on December 4th.

Mr. A. H. Seymour, of New York, is now receiving United Press at Waterbury, Conn.

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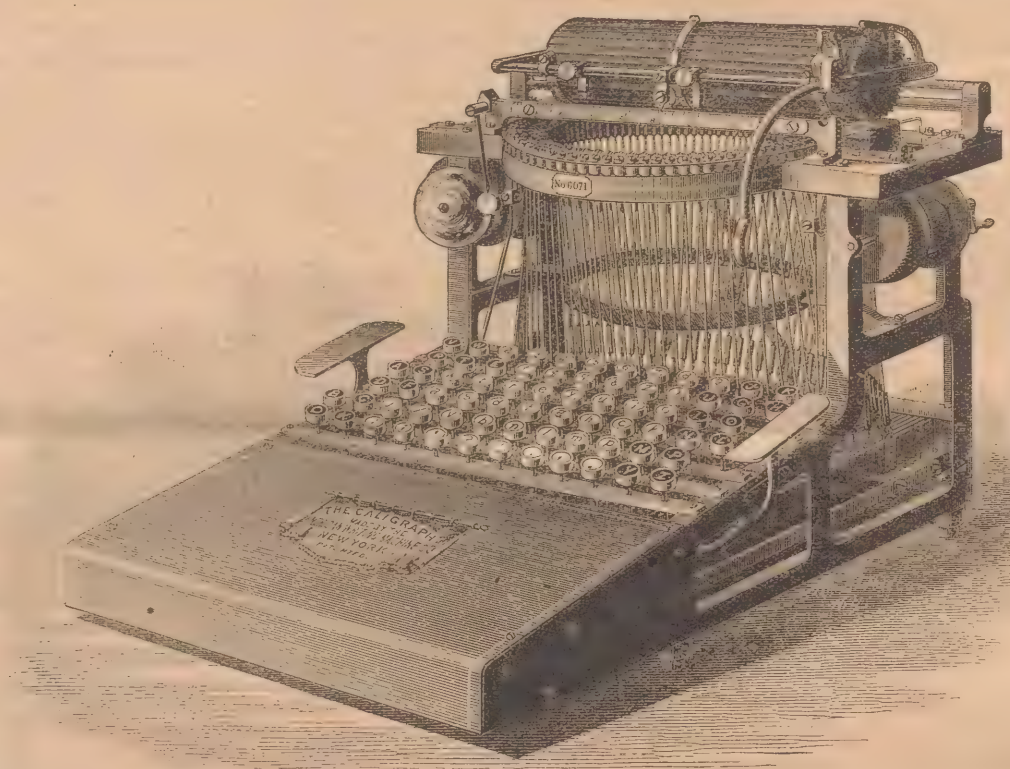

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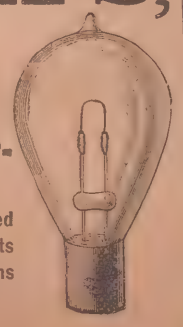

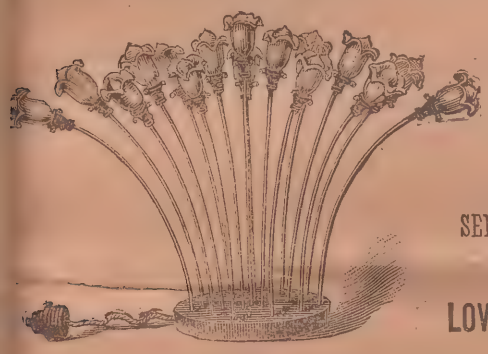

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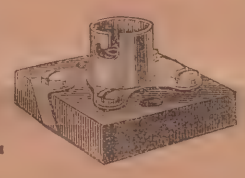

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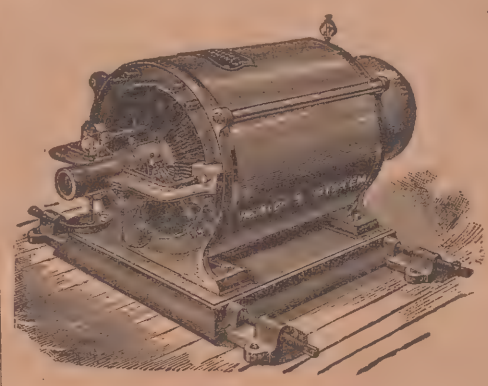

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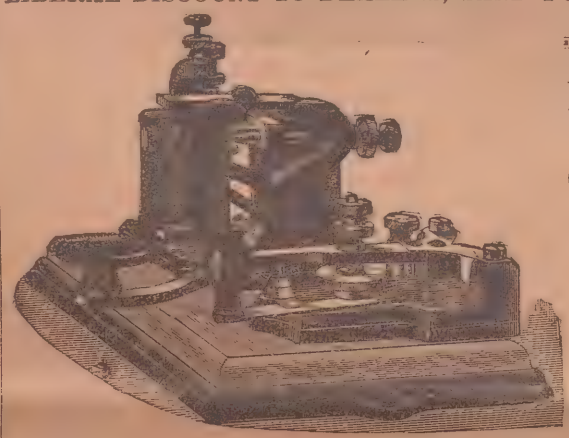

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THE ELECTRIC AGE

TELEGRAPH SUPPLEMENT.

VOL. VII—No. 15. NEW YORK, JANUARY 1, 1890. PRICE 10 CENTS.

THE BEGINNING OF THE END.

Edison Company Sustained. Westinghouse Company Defeated.

Sawyer-Man Patent Decided by the Court to be a Fraud and Absolutely Valueless.

Extracts from the Decision of Justice Bradley, Oct. 5, 1889.

Circuit Court of the United States for the Western District of Pennsylvania.

THE CONSOLIDATED ELECTRIC LIGHT COMPANY
(WESTINGHOUSE COMPANY)
versus
McKEESPORT LIGHT COMPANY
(EDISON COMPANY).

No. 5, May Term 1888.
On Bill and Final Hearing.

EXTRACTS FROM OPINION OF THE COURT.

"The great question in this suit is whether the patent sued on is valid, so far as involves a general claim for the use in electric lamps of incandescing carbon conductors made of fibrous or textile substances. If it is, the complainant must prevail. If it is not, the bill must be dismissed"....

"Is the patent valid for such a broad claim? The defendants contend that it is not; first, because no such invention was set forth in the original application, but was introduced more than four years after it was filed, and after the same material had been used by Edison, and claimed by him in application for a patent; secondly, because Edison, and not Sawyer-Man, was really the original and first inventor of an incandescent conductor made of fibrous or textile material for an electric lamp."....

"It is very clear to us that in the original application for the patent sued on the applicants had no such object in view as that of claiming all carbon made from fibrous and textile substances as a conductor for an incandescing electric lamp. Nothing on which to base any such claim is disclosed in the original application. We have carefully compared it with the amended application, on which the patent was issued, and are fully satisfied that after Edison's inventions on this subject had been published to the world there was an entire change of base on the part of Sawyer & Man, and that the application was amended to give it an entirely different direction and purpose from what it had in its original form."....

"By an adroit amendment made in 1885, they say: 'Our improvement relates more especially to the incandescing conductor, its substance, its form and its combination with the other elements composing the lamp.' The purpose of this amendment is obvious, and needs no comment."....

"The fact is that Sawyer & Man were unconscious that the arc was not new, and supposed that they could get a patent for it; but, as their eyes were opened, they changed about and amended their application, and made the material of the conductor the great object—carbon made from fibrous or textile material. Compare the original with the amended application, as first stated in this opinion, and this purpose most obviously appears."....

"The fact that the whole object of the application was changed is evinced by the correspondence of the parties."....

"This testimony of Mr. Broadnax, which is undoubtedly to be relied on, in connection with the letter just quoted, shows that the idea of claiming carbons made from fibrous and textile materials was an afterthought, and was no part of the purpose of the original application. The amendments relating to this new and broad claim were made afterward, in February and March, 1885."....

"We are of the opinion that the changes made in the application in this regard were not justifiable, and that the claim in question cannot be sustained."....

"We are not at all satisfied that Sawyer and Man ever made and reduced to practical operation any such invention as is set forth and claimed in the patent in suit. Their principal experiments were made in 1878, and perhaps the beginning of 1879. The evidence as to what they accomplished in the construction of electric lamps is so contradictory and suspicious that we can with difficulty give credence to the conclusions sought to be drawn from it. **We are not satisfied that they ever produced an electric lamp with a burner of carbon made from fibrous material, or any other material, which was a success."**....

"The application for the patent in suit was not made until January, 1880, nearly or quite a year after all their experiments had ceased, and after the inventions of Edison had been published to the world."....

"The explanations made by the complainants for the delay in applying for the patent in suit fail to satisfy our minds that Sawyer & Man, or their assignees for them, have not sought to obtain a patent to which they were not legitimately entitled."....

"But, suppose it to be true, as the supposed inventors and some of the other witnesses testify, that they did in 1878 construct some lamps with burners of carbon made of fibrous material, and of an arched shape, which continued to give light for days or weeks or months; still, were they a successful invention? Would any one purchase or touch them now? Did they not lack an essential ingredient which was necessary to their adoption and use? Did they go any farther in principle, if they did in degree, than did other lamps which had been constructed before? It seems to us that they were following a wrong principle—the principle of small resistance in an incandescing conductor, and a strong current of electricity—and that **the great discovery in the art was that of adopting high resistance in the conductor with a small illuminating surface, and a corresponding diminution in the strength of the current. This was accomplished by Edison in his filamental thread-like conductors, rendered practicable by the perfection of the vacuum in the globe of the lamp.** He abandoned the old method of making the globe in separate pieces, cemented together, and adopted a globe of one entire piece of glass, into which he introduced small platinum conductors, fastened by fusion of the glass around them, thus being able to procure and maintain perhaps the most perfect vacuum known in the arts. In such a vacuum the slender filaments of carbon, attenuated to the last degree of fineness, may be maintained in a state of incandescence without deterioration for an indefinite time, and with a small expenditure of electric force. **This was really the grand discovery in the art of electric lighting, without which it could not have become a practical art for the purposes of general use in houses and cities."**....

"The principle and great thing described is the attenuated filament and its enclosure in a perfect vacuum."....

"We think we are not mistaken in saying that but for this discovery electric lighting would never have become a fact. We have supposed it to be the discovery of Edison because he has a patent for it. This may not be the case. It may be the discovery of some other person; but, whoever discovered it, it is undoubtedly the great discovery in the art of practical lighting by electricity."....

"THE BILL MUST BE DISMISSED."

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NEW YORK, JANUARY 1, 1890.

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Owing to the growing demand upon our space we have been compelled, to meet the requirements of the electrical profession, to issue the ELECTRIC AGE weekly. This edition of the paper will, however, be issued semi-monthly as heretofore, but its columns will be relieved of the matter of a more technical nature, in which its readers have little or no interest whatever. We would gladly have issued for the telegraphic profession a weekly paper as was urged by a few and for which we have adequate facilities, but the step would certainly have threatened the life of the paper, inasmuch as we do not believe the requirements of the telegraph interests warrant more than a semi-monthly publication. Certainly it would not be possible to expect the same amount of support as is now given this paper were it to be made a weekly, and anything less would not pay for its production. We do not believe in catering to more than one interest in one publication, hence the change by the addition of the words "Telegraph Supplement" to the title of the paper to make it distinct from the general electrical paper.

It was our intention to produce in addition to this paper, a "Telephone Supplement" and possibly a "Railroad Supplement," but these subjects have been laid aside until such time as we feel certain of success.

The pages have been enlarged in order that more matter may appear in each issue, and to admit of our producing such cuts as may be of interest to our readers, and which have heretofore been crowded out for want of space.

We shall be exceedingly gratified to learn that we have been mistaken in supposing that the telegraphic profession does not require a weekly journal, and to encourage those who have so kindly urged us, beginning with the new year, we will state that we are prepared to make this change at a moment's notice.

We desire to express our heartfelt thanks to all our friends for their many favors and our congratulations to the profession at large for the excellent record it has made during the first year. We hope 1890 may be a year of unusual prosperity to all.

TELEGRAPH PLANT NOT FOR SALE.—It transpired that the rumored sale of the Empire and Bay State telegraph property to Eliot F. Shepard is unfounded and that the plant is not for sale at all. The wires have been erected to lease and it is said they have been strung in a substantial manner and with a view of giving satisfaction to whoever leases them. The plant consists of four number nine gauge copper and two number two gauge iron wires to Boston via North Attleboro, Mass., with an extension to Providence.

A VERDICT FOR THE WESTERN UNION.

The Supreme Court of the United States on December 16th rendered a decision in the case of the Western Union Telegraph Company against the Secretary of State of Alabama brought here on appeal from a decision of the Supreme Court of Alabama. The question involved the constitutionality of a law of Alabama imposing a tax upon the gross receipts of telegraph companies for business done within the State. The company was taxed not only on business done entirely within the State, but on messages sent to or received from other States. The United States Supreme Court has six or eight times within as many years decided that messages sent from one State into another are not subject to taxation, because it would be an interference with Inter-State commerce. Judgment reversed.

FOR THE RELIEF OF MILITARY TELEGRAPHERS.

Mr. W. J. Dealy, chairman of the Committee on Congressional Action, has just sent out important circulars to each of the members of the Old Timers' Association and the members of the Society of the United States Military Telegraph Corps.

The documents have been carefully drawn and the argument in favor of a speedy passage of the bill now before Congress is thorough and complete. Each member of the societies is called upon to interview his eSnators and Congressman and state the case clearly to them, pointing out what the generals of the army and others have said in reference to the important part played by the military telegraphers during the late civil war. If these intelligent instructions are carried out by even one-half of the members, success is assured.

The full text of the bill now before Congress is as follows:

A BILL FOR THE RELIEF OF TELEGRAPH OPERATORS DURING THE WAR.

Whereas, Except commissioned officers, those persons engaged in the military corps of the United States during the war of the rebellion, e[illegible]ough performing strictly military duties, [illegible] by some lost their lives, and others were wounded or imprisoned, have received no official recognition for their fidelity, intelligence, bravery, and efficiency; and

Whereas, As an integral part of the army, they ought to have been accorded a military status corresponding in rank to the services so meritoriously performed; and

Whereas, By reason of the death of many army telegraphers, and other difficulties developed by the lapse of time, it is at this time inexpedient to confer actual military rank upon members of said corps. Therefore,

Be it enacted, etc., That all persons engaged in the operation and construction of military telegraph lines during the war of the rebellion, are hereby declared to have been a part of the army of the United States; and the Secretary of War is hereby directed to prepare a roll of such persons, and to issue to each upon application, unless it appears that his service was not creditably performed, a suitable certificate of honorable discharge, reciting this act and the term and character of his service, as well as the relative rank of such person assimilated to that conferred by law upon commissioned officers of the army receiving a monthly pay most nearly approximating that of such person at the time of his discharge.

Provided: That this law shall not be construed to entitle the persons herein mentioned to any pay or rights not herein specifically provided for.

Mr. James D. Reid writes: "With the New Year my new work will begin, and I will begin then also to form a new world about me of new faces and new friends. But the new friends will never obliterate the old ones, nor will anything ever efface from my memory and heart the wonderful demonstrations of affection which those old friends have shown me. I have been unable to understand it all, and often sit down by the fireside here and wonder over it; and I take out that beautiful gold medal and puzzle myself over its meaning and devices. It all seems like a dream, and I have to dream on and my heart sends forth its messages to those old friends for a Merry Christmas and a Happy New Year.

"I see," said a well known operator the other day as he entered our sanctum, "we are likely to have a larger number of fast senders than ever before."

"Why so?" asked the office boy.

"Because" was the reply, "they are all acquiring the Russian grip and—"

Then the paste pot hit him and he was taken to the Morgue.

Mr. E. Rosewater, founder, editor and proprietor of the Omaha, Neb., *Bee*, is an old-timer and a U. S. M. T. operator. On Dec. 21st, Mr. H. V. Bemis, of the Hotel Richelieu, Chicago, Ill., gave an elegant dinner in honor of Mr. Rosewater. Mme. Patti-Nicolini, who esteems Mr. Rosewater as one of her oldest and warmest friends among the newspaper men of America, graced the assemblage with her presence, and the occasion was as pleasant as it was informal.

Mr. Jno. W. Roloson, the popular night manager of the Postal at "187" was pleasantly surprised Christmas evening on receiving from the members of his staff a token of esteem in the shape of a handsome ebony cane, gold-mounted, exquisitely designed and suitably inscribed.

"There's a prevalent idea in the profession," said a well known minstrel, "that a fellow who sticks to a banjo never goes broke." The number of operators who own banjos is comparatively small.

The argument in case Great Northwestern Telegraph Company against the Montreal Telegraph Company, at Montreal, is concluded. Judgment will be rendered in a few days.

News reaches us that the cable between Rio de Janeiro and Maranham has ceased to work. The cause of the interruption is, as yet, unknown.

THE INTERIOR ELECTRICAL CONDUIT COMPANY'S SYSTEM OF WIRING.

The necessity for a perfect system of wiring the interior of buildings for lighting purposes has long been felt. Indeed, this branch of electrical lighting seems to have been almost entirely neglected in the rapid march of improvement in every other feature of the business. Dynamos have been made more efficient, lamps improved, and wire made cheaper, and insulation made more perfect, but few have given any thought to the subject of properly wiring buildings. The usual method of conveying the current to lamps is either by enclosing the wires in the plaster, or in attaching a molding to the walls and ceilings on which the wires are run. The first method is unreliable on account of the liability of leaks due to the destruction of insulation by the plaster, and the objection to the second is the unsightliness of the strips of molding, which cannot, at the best, be laid in such a way as to be pleasing to the eye. Every objection to all present methods of wiring is overcome in the system of the Interior Electrical Conduit Company, of this city, and its many advantages are the result of a long familiarity with the difficult conditions existing, and great ingenuity is shown in the evolution of details and special devices.

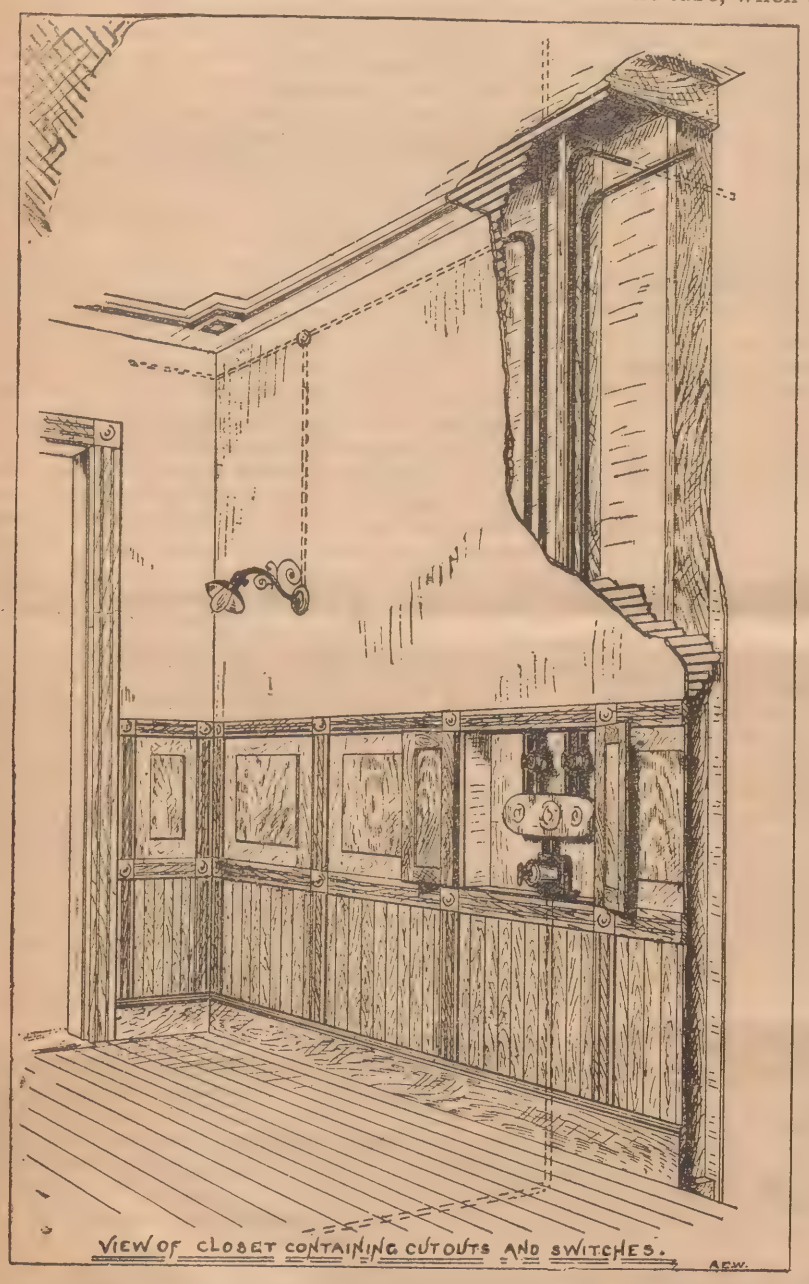
Broadly stated, the system of the Interior Electrical Conduit Company consists in the use of a light flexible insulating tube, or conduit, which is carried through a building, pretty much as gas pipe or water pipe is, and which serves as a duct or repository for the distribution wires.

But the idea of the tube, or conduit, has combined or associated with it the use of a new and ingenious insulated wire known as the "safety conductor." These special features are, in turn, the appropriate and adequate complements of a scientific "system of distribution."

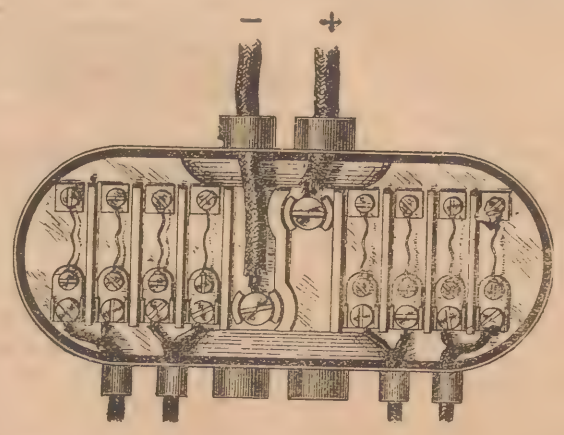
As a result of the combination of these three features—the conduit, the safety conductor and the system of distribution — five important points are secured, namely, *Safety*, *Convenience*, *Accessibility*, *Economy* and *Durability*.

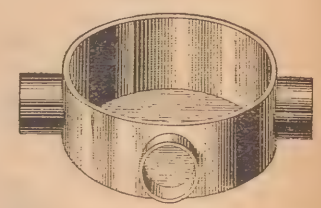
The tube used by the Interior Electrical Conduit Company is made of a species of paper or papier maché, and combines flexibility with great power of resistance to strain. After it has been made to special process, it is subjected to treatment with some secret bituminous, asphaltic compound that renders it thoroughly non-conducting and impervious to moisture. The tube, when cut with a knife, exhibits every evidence of complete impregnation, and stubbornly resists every attempt to permeate it with [wa]ter. This tube is made in sizes [ra]nging from ½ inch to 1¼ inches inside diameter, and in lengths of 10 feet. These lengths are joined together by sleeve couplings and are threaded, and can be right-angled or be fitted with elbows for rounding curves and corners. Here at once, in such a tube, we have, beyond the mechanical shield from injury, such a protection against internal or external fire as has never before been provided. In order to insure positively the operation of the safety devices employed in electric circuits, the conductors, composed of stranded copper wires, are separately insulated, then laid up together and jacketed in a common sheathing of suitable material.

Thus, while the wires are normally and properly insulated, there is no absolute bar to a short circuit; and instead of a slow smoldering, there is instantaneous compulsion to short circuiting and blowing out of the safety fuse, so that any trouble instantly declares itself an[d] disappears. The conduits all lead into ma[in] junction boxes, while smaller junction and i[n]

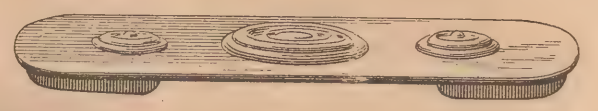


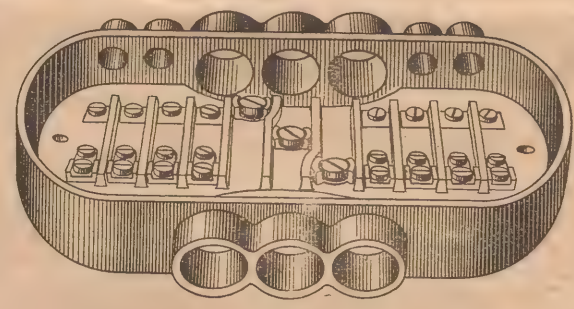
VIEW OF CLOSET CONTAINING CUTOUTS AND SWITCHES. A.F.W.



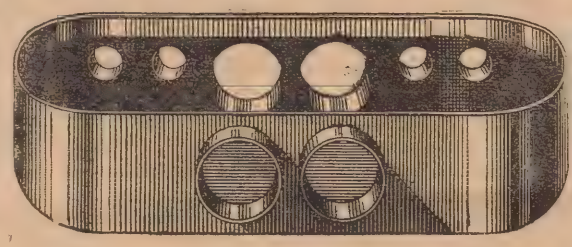


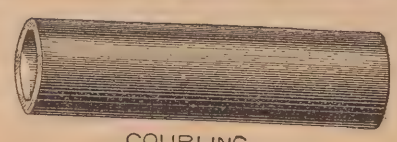
BRANCH LINE. THREE HOLES.



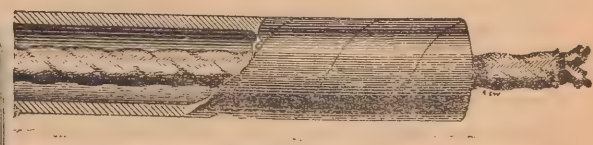


INTERIOR AND EXTERIOR OF JUNCTION BOX.

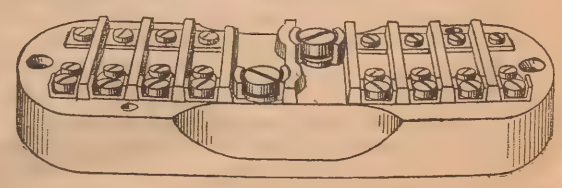




COUPLING.



SECTION OF CONDUIT WITH TWIN CONDUCTOR.



tersection boxes and outlet terminals make safe and ample provision for the ramifications and convenience of the service.

Wiring by the old plans is decidedly inconvenient, but the new system changes this. Every architect is familiar with methods of disposing of piping in his plans, and he has simply to carry out the same method applied to these electric conduits. Thus decorations and plastering are spared.

In the matter of accessibility the system of the Interior Electrical Conduit Company is preeminently one which provides for the future. There is no other that does. The carrying capacity of the circuits can be increased or changed in any way according to requirements.

It is noteworthy, too, that the conduit possesses marked advantages as a speaking tube, and that in this department alone it is expected to gain pre-eminence, being cheaper than metal, and at the same time being perfectly smooth inside and free from the seams and joints that impair the transmission of sound through metal tubes.

This company has also wired and conducted the following well-known gentlemen's houses: J P. Morgan, for 750 lights; Elihu Thomson, Lynn, Mass., 100 lights; also the Metropolitan Telephone building, 600 lights; Union Trust Company's new building, 2,000 lights, and have contracts for conducting and wiring the new *World* building in Park Row and the new Madison Square Garden when completed. This system, as will be seen, is gaining great popularity, and a large number of prominent architects demand it upon their specifications.

SIZES OF STRAIGHT TUBE, AND AN ELBOW TO OUTLET.

THE ELECTRIC LIGHT IN LONDON.

Much complaint is heard of the frequent tearing up of the streets of New York to lay subways for electric wires While the horrible condition of our streets is sufficient cause for bitter complaint, there is consolation in the fact that New York is not the only place that is suffering from this state of affairs. London is having similar experience, and from the accounts we read in the papers of that city the patience of the Cockneys must be severely tried. According to one writer, Londoners are not very enthusiastic over the new light. They have taken Mr Edison's words expressed in a recent number of the *North American Review* too much to heart, and they ask, if 110 volts are sufficient to "melt paving stones," what will 10,000 volts do should the current get on a rampage? If our London friends are going to use a pressure of 10,000 volts they must see that their lines are properly constructed and wires properly insulated. If every precaution is taken to insure safety to life and property, 10,000 volts will be no more dangerous than 1,000. However, the constructing companies are prosecuting their work, and it will not be long before London will be made resplendent with the greatest light of the age.

The "dead" wire is by all odds the liveliest corpse now on the streets of American cities.

Mr James F. Kelly, the genial sales agent of the Edison Machine Works, has been appointed General Sales Agent in the United States for Mr. Edison's new battery. Should the business receive the same push and energy as has the wire interests under his supervision, the battery will soon be found everywhere where electricity is known and needed. Recent tests of the Edison Battery, by electrical experts. verify the statements made recently concerning the merits of this cell. The title of the company will be the "Edison Manufacturing Co.," and the New York office is located at 19 Dey street.

The Canadian Electrical Society proposes to hold an invitation conversazione during the winter, at which several interesting exhibits will be displayed and explained to visitors, such as the telegraph, telephone, fire alarm, electric light, phonograph, medical electrical apparatus, etc.

At a recent meeting of the Mexican Northern Telegraph and Telephone Company, the following directors were elected: John W. Weed, Winthrop Pond, William T. Patterson, Robert Colgate and John J. McGinty. Mr. Weed will be elected president and Mr. McGinty secretary, at the first meeting of the Board.

The telegraphers of Toronto will hold their first annual ball in that city on Friday evening, January 10th, 1890.

The new warerooms of the Bergmann Electric Light and Gas Fixture Company, at 79 Fifth avenue, are a model of beauty. A large room is devoted to both electric light and gas fixtures and a smaller one to gas fixtures alone. The designs represented therein are only about one-quarter of the different styles made by this company, but the artistic manner in which the electroliers and gas fixtures are arranged upon the ceiling and side walls show them off to great advantage. This company has always had the name of turning out the finest goods ever placed on the market, and we understand they are now unable to keep up with the demand for their fixtures. Their works on 34th street are manned by the most skilled workmen; hence the superior quality of work done by them.

The Pacific Telephone Company, of San Francisco, has purchased the Mercantile Library building on Bush street for $157,000, and will make it a six-story brick building. The alterations will cost over $50,000. The telephone company proposes spending $150,000 in underground conduits; and will also put in a new switchboard costing over $100,000.

At the next military manœuvres in France a new application of telegraphy will be made, which innovation, it is thought, will be of the greatest utility in time of war.

The Holtzer & Cabot Electric Co., of 111 Arch street, Boston, although only in its infancy, has grown to such an extent during the past year that it now ranks as one of the first representatives in the electrical line in the East. The work done by this company is performed by the most experienced and expert workmen, and as they only handle the finest goods, the popularity into which they have sprung is well earned, and their work is highly appreciated by their customers. Their growth has been phenomenal. They represent some of the best electrical houses in the United States and are turning out new and valuable articles to the electrical field, many of which are important additions to these interests.

A glazier in the employ of the Lake Shore Railway at Toledo, Ohio, was instantly killed on the 16th of December, by coming in contact with electrical light wires. He was on the roof of the freight-house doing some work, and it is thought that he slipped, and in his efforts to regain his feet he must have taken hold of the wires which were close by. He was forty years of age, and leaves a wife and one chiid.

Mr. George Shaver, of the Shaver Corporation, has just returned from Buffalo, N. Y., where he has been for the past three months erecting two exchanges, one a nine and the other a ten-station plant. He also put in three factory plants of nine stations each. Fifty-nine stations are now in operation in Buffalo, and as many more orders for Shaver telephones remain to be filled. General satisfaction has resulted in all cases.

After three years of the incandescent light in the house of a gentleman in England, in which was a collection of fine water-colors, he finds that some of the more delicate pigments have begun to fade. The arc light has been found far richer in actinic rays than the incandescent. Magnesium light approaches nearest to that of the sun in the proportion of colored rays.

The Western Union Telegraph Company are establishing a dynamo plant in their Chicago office to supply the current for their wires. About 30,000 cells of battery will be thus displaced. Sixteen No. 2 Edison dynamos and four Edison special dynamos will constitute the electrical outfit. It is expected to have the plant in operation about the first of the new year.

Senate bill 208, introduced by John C. Spooner, of Wisconsin, and referred to the Committee on Interstate Commerce proposes to place all telegraph companies, whose business is not confined to the limits of one State, in substantially the same position before the Interstate Commerce Commission as that occupied by the railroads.

There is talk of an electrical railway between Athol and Orange, Mass. The distance of the proposed line is 5½ miles, and the line is estimated to cost $75,000. Those in a position to judge say the road would pay. Considerable interest is manifested in the project in both towns.

Bill in equity was filed at Boston December 18. in United States Circuit Court by the American Insulator Co. for injunction to restrain the Electrical Glass Corporation from making double petticoat insulators, same being an infringement of patents held by the plaintiff.

An Edison central station will furnish Buenos Ayres with 30,000 Edison electrical lights and some 6,000 arc lights. Other smaller works of the same company will be established in other parts of that city.

The claim that telephone business is conducted on sound principles seems plausible, but really it is supported merely by hearsay evidence.

The wires of the Western Union Telegraph Company in Philadelphia are to be placed under ground.

Our esteemed contemporary, the *Railway Service Gazette*, for December 19th, reaches us, containing thirty-two pages of interesting matter to its clientage. Brother Leflet is to be congratulated on the manner in which he made all the advertising pages appear next to reading matter. Such good judgment not only gives satisfaction to the readers, but convinces the advertiser that the management of the paper has his interest in view at all times.

C. P. R. Eastern Division Notes.—S. D. Ward, agent, Wolf River, has resigned and gone to try his luck in the Far West, Tacoma, W. T. We wish him every success. W. Louttit, promoted, Heron Bay, nights, to Wolf River, as agent. Mr. McQuane goes to Heron Bay. W. D. Nix, transferred from Trudeau to White River, to fill the vacancy caused by Mr. Jeffries' departure. The heartfelt sympathy of the fraternity is extended to Mr. Nix, who has only been on this division a few weeks, and has had, since going to White River, the sad misfortune of losing his wife. Mrs. Nix's illness was very sudden, and before friends could be notified, she was no more, nothing but a sad, sweet memory to those who had known and esteemed her many good qualities. Her remains were interred at White River, in a strange land, among strangers.

C. P. R. Western Division Notes.—A. J. Purchase has returned from vacation. Mr. J. H. Longworth, president of the Station Agents Association and agent C. P. R. Port Arthur, has left for a month's holiday. Mr. Longworth will visit Charlottetown, P. E. I., and other eastern cities. Among his friends it is whispered that he will return with a charming better half, selected from among the belles of the capital city of the island province.

C. P. R. Notes.—G. B. Fraser, night operator "X" office, has been transferred to Swift-Current, N. W. T.; A. A. Marllatt, Rat-Portage, transferred to Port Arthur, nights; D. Gignac, Kalmar, transferred to Rat-Portage, nights. Mr. Crawford, of Savanne, paid Port Arthur a visit a few days ago.

New York Aid Society.—We have examined and found correct the accounts of the Secretary ane Treasurer for the quarter ending Dec. 6, 1889, and respectfully submit the following report:

Balance on hand, Sept. 7, 1889,		$2,136 95
Receipts—		
Fees,	$ 17 00	
Dues,	850 00	867 00
Total,		$3,003 95
Disbursements—		
Sick Benefits,	$570 29	
Death Claims,	300 00	
Miscellaneous,	34 92	905 21
Balance on hand,		$2,098 74

Signed, E. F. STEVENS, D. C. DONOHUE, EDWIN DEAN, } Auditing Committee.

Mr. J. Tuck, of 195 Broadway, N. Y., is now in Atlanta, for the winter.

Peter Adams and Alex. Morison, of newspaper bureaus, have gone to Canada to spend the holidays with friends and relatives.

Married.—Oct. 16, Mr. D. S. Field, of Columbus, Ohio, to Miss Emma Sieck, a Cincinnati, O., lady. The ceremony was performed by Rev. E. K. Bell, of Cincinnati, at the lady's residence. The happy couple repaired to Columbus, where they intend settling down for a while.

City Editor of the New York *Evening Telegram*, Mr. R. D. Blumenfeld writes, as follows: "I view with pleasure the advance of the Age, and I am glad to have the opportunity of tendering my congratulations." Mr. C. L. Hallett, agent for this journal at Port Arthur, Ont., states in a recent letter: "The Age is getting there with both feet and capturing every one who is interested in electricity in this section."

St. Louis W. U. Notes.—The prompt manner in which this office took hold of the Age subscription list demonstrates that the management as well as the operators know a good thing when they see it. However, a more general recognition and support of this, the operators' only representative, is desirable, and it is hoped that many others will come forward with their subscriptions. By a continued support of the Age and representation in its columns this office will be enabled to secure the position which it merits among the leading offices of the country, and whatever is accomplished in this direction will prove of practical benefit to every operator. There have been but few changes since our last letter. Operator V. Schuler has accepted a position with the W. U. at Hot Springs, and left on the 17th inst. Miss Jessie Summers and Miss Mamie Hall, of the day force, who have been absent for a week on account of sickness, are again on duty, also Miss Emma Neslage, of the Wheatstone department, who has just recovered from a severe illness Mr. Joseph Masker, late chief of the Southern division, is laid up with a serious affection of his left limb. It was feared that amputation would be necessary, but we are glad to state that the physicians think the limb can be saved. Mr. Masker has the sympathy of the entire force and wish for his speedy recovery. Our most charming tenor and affable gentleman, Mr. Charles N. McNeill, the McAneeny of St. Louis, is the object of untold persuasion from telegraphic circles, the aim being to secure his services for a grand musical festival to be graced by the shining lights of the telegraph in St. Louis. It is to be hoped that Mr. McNeill will respond to this demand upon him and appear as the central figure in what undoubtedly will be the grandest social event, telegraphically speaking, ever held in this city. The W. U. Tel. Co., among other corporations, has been arraigned for non-compliance with the anti-trust law of Missouri. The company, however, continues to do business at the old stand, with no charter that can be revoked by Missouri's secretary of state. Chief Operator J. H. Topliff has been out of the city for a week on business for the company. During his absence the executive functions of the office were assumed by the assistant chief, Mr. A. R. Pippit. Messrs. Appleby and Danforth of Chicago are here on a visit and will remain until they have completed their full round of New Year's calls. At some date not far distant we hope to publish the entire personnel of the office, also from time to time keep the outside telegraphic world informed as to what transpires at this, the centre of the "favored circle."

Missouri-Pac. Notes.—The general telegraph office of this company is located in the Missouri-Pacific building, and is presided over by Mr. C. M. Klein, whose genial spirit and accommodating ways make him a popular chief. Business is especially heavy at this season, and the eleven wires in the office are constantly employed in the service of the company. A quadruplex circuit is worked to Sedalia and Atchison, and a duplex to Little Rock. Our single wire to Pueblo, Colo., a distance of 900 miles, works like a charm and accommodates over 300 messages a day. Ten messengers are employed to handle the work of the delivery department. Following is the personnel of the operating force: Chief Operator, C. M. Klein; Assitant Chief, M. J. Gannen. Operators: J. Dermody, J. T. Sullivan, J. M. O'Neil and F. B. Moore, who work a split trick; days: E. C. Taylor, late arrival from the Cotton Belt; H. A. Homeyer, an old-timer; Mr. T. D Cannon and C. A. Dawkins; Mr. F. B. Moore is night chief, with C. M. Davenport, all-night operator.

The Commercial Cable Co. has our hearty thanks for the Holiday Greeting sent us. The card bearing the same was an excellent piece of lithography, containing a distant view of New York and Brooklyn, showing the great bridge spanning the East River, the Statue of Liberty, the North and East Rivers and a cut of the Thomson Siphon Recorder. The Commercial cables were shown on miniature globes representing the world. The work was very creditably done.

Washington Notes.—I will now satisfy my illustrious friend "Buckeye," of Cleveland who was so shocked over what he termed the fake announcement of the issue of Nov. 15th relative to the fine piece of work done by Mr. Ed. Thompson of this office. I wish, first, to state that my announcement of this work was simply embodied in my Washington Notes. It was not thought to be unsurpassed, bless your soul, me boy. The same thing on a smaller and sometimes a large, scale, is a nightly occurrence. The editor of the Age evidently recognized and appreciated the good work, hence cut that part of my notes, made a special feature of Mr. Thompson's work, thereby raising the ire of "Buckeye," who failed to receive that credit he so earnestly craved for, pressing into service his check boys and messengers, during the transmission of a batch of reds to him, which he successfully works off in his tirade against myself. For his benefit I will the tale unfold. On the night in question the traffic chief came to your correspondent with the statement that Mr. Ed. Thompson had performed a fine piece of work, having averaged 84 messages per hour for three consecutive hours. Down went a note of it. Several days afterward, in glancing over my subscription book, "prior to mailing you a list of new subscribers," I observed this note. The thought struck me, "here is an item." My notes were at once written and mailed. In the issue of Nov. 16th, while glancing over the notes from *out of the way places*, I discovered "Buckeye's" war whoop. I made a note of his complaint. Since then I have made an investigation. I find that "Buckeye" in some respects is right, and in some he is wrong. There was more than one man copying, but there was at no time as many as five. When Mr. Thompson started in, Pittsburgh could spare but two men, about midway through the pile another man was spared: these three finished the batch. The work might have been done much quicker had Pittsburgh been able to furnish a few "resters," but Pittsburgh is a busy office, so that was out of the question. Now we will take "Buckeye's" own statement as to actual figures. He is basing his calculations on an average. He delves down deep into mathematical problems, out of which he digs the startling fact that there was only an average of 18⅔ words per minute. To be exact and plain, we will say two and a half men were copying the entire three hours. If "Buckeye" credits a speed of 19⅔ words on the five men basis, then he naturally concedes twice that much on the two and a half men. Certainly, or, in other words, 39⅓ words per minute. Now we will take the average number of words and see how it looks reduced to messages. In the 180 minutes there were just 7,080 words, or 79 thirty-word messages (the companies' press average), 93 twenty-five-word messages, and 117 twenty-word messages per hour. Now, Mr. "Buckeye," do you think you could sit at the other end of the wire and hold it up, and remain under the delusion that your 19⅔ words per minute version was the correct one? Again, each and every one of these messages had to be numbered and timed. Will Mr. "Buckeye" take 253 pieces of paper, number and time them with his left hand, while he manipulates the key with his right, and tell me what he accomplishes in the three hours. Have I not said enough to clear away the mist that pervades his atmosphere? On January 1st Mr. J. G. Bickers and E. W. Smithers, of this office, will start in with the Associated Press. In securing these two gentlemen the Associated Press have done well. Both are experts on the typewriter and strictly first-class operators. Among the late arrivals are Denny Brown, Messrs. Porterfield, Hasson, of Pittsburgh; Boggs, Biggs, Henry Klotz and Mr. Green, of New York.

Saluda.

Mr. T. Sullivan, of Columbus, O., is spending the holidays with friends at Corry, Pa.

THE NEW YORK TELEGRAPH CLUB NOTES.—Prominent among recent visitors are the following: Mrs. Walter Heffer, of Winnipeg, Manitoba; Miss Alice L. Warlock, of St. John, N. B.; Allan L. Baer, Norwich, Conn.; L. B. Pearson, Chicago; J. M. Lane, of Brooklyn; T. W. Baer, Wm. Weaver and W. H. Stetson, of Philadelphia. Acknowledgments of honors conferred by this club are due from Messrs. Benj. Thomas, of Chicago; W. J. Murphy, Ridgewood, N. J.; Henry Bentley, of Philadelphia, and Frank L. Pope and Cyrus W. Field, of New York,—all of whom have been elected to honorary membership. The annual ball will take place in Central Turn Hall, Feb. 3. In view of the work performed by Secretary Watts, as chairman of the committee of arrangements, it is hoped a large concourse of people will assemble to give it *eclat*. Geo. W. Hann, chairman of the governing committee, is absent on a vacation. The next regular meeting occurs on the second Tuesday in March. Come all ye. Chas. Power has been appointed chairman of the committee on the revision of the Constitution and By-Laws. A meeting has for some time past been held at 3 o'clock every Saturday afternoon and last week saw the completion of the members' deliberations. "Presented to The New York Telegraph Club by a fellow craftsman" is the inscription Mr. Andrew Carnegie has written in his "Triumphant Democracy" that accompanied "Round the World" and "An American four-in-hand in Britain," which are among the choicest contributions to the club's library. To Second Vice-President Conrad A. Meyer we acknowledge with thanks the receipt of two volumes of McGee's "History of Ireland." Mr. Thomas Brennen, one of our recently elected honorary members, has contributed a handsomely bound volume of Terry and Finn's latest editions of "Illustrations and Descriptions of Telegraphic Apparatus," for which we return thanks. We take this opportunity to thank the ELECTRIC AGE Publishing Co. for several volumes of Statistics contributed by its president, J. B. Taltavall. The selection of Mr. R. C. McDonald by the president to succeed as governor Mr. J. H. Lounsbury, now out of town, is looked upon with favor by every member of the club. The following letters of acceptance have been received from honorary members:

My Dear Sir :—I beg to acknowledge the receipt of my certificate of membership in the New York Telegraph Club, which was handed to me upon my return to the laboratory. The fact of my being elected an honorary member of your association has caused me much gratification, and I appreciate highly the compliment to myself embodied in such action.

Yours very truly,
THOMAS A. EDISON.

Dear Sir :—Your favor of the 2d inst., advising me of my election as an honorary member of the Telegraph Club, came to hand during my absence from the city. I desire now to thank you and the gentlemen associated with you for the recognition given to the Associated Press by your action; and I think myself fortunate in being the representative of this news organization at a period of modern times, that is witnessing such wonderful activity in the promotion of electrical science. The New York Telegraph Club has an interesting future before it. Again thanking you,

I am yours, very sincerely,
WILLIAM HENRY SMITH.

My Dear Sir :—I beg leave to acknowledge receipt of your esteemed favor of the 2d inst., conveying notice of my election to an honorary membership in the New York Telegraph Club. It is my pleasure to accept the same, and purpose to bear well all its duties and responsibilities. Please express to the club my high appreciation of the honor conferred in its action, and wishes for the pleasure and prosperity of its every member.

Yours very truly,
CHAS. A. TINKER.

Dear Sir :—I hereby acknowledge the receipt of the certificate of honorary membership in the Telegraph Club. I desire to express to yourself, and to the members of the club, my hearty appreciation of the honor conferred. I have been in full sympathy with the undertaking from its inception, believing that such an organization would have an influence for good, and this belief is gaining strength day by day as the good effects are observed. Congratulating you upon the flourishing condition of the club and predicting still greater success for it in the future,

I remain, sincerely yours,
ALBERT E. SINK.

Dear Sir :—I am in receipt of the certificate of honorary membership in your club, and also, of your communication of the 25th inst., bearing thereon, and I have to thank you and the members of the club for the honor which you confer upon me. It shall be my continued endeavor to make myself worthy of the esteemed consideration which you have seen proper to give me. Being a member, I have to inform you that it shall be my desire to further the interests of the club by every effort in my power and on every occasion. With the desire that the club's career shall be one of unprecedented success, I have the honor to be,

Very truly yours,
EDWARD C. COCKEY.

Dear Sir :—Permit me, through you, to sincerely thank the members of the New York Telegraph Club for the unexpected honor conferred on me in electing me an honorary member, and to say, in accepting, I appreciate it most highly. That I have not been an active member was not due to a lack of interest in the club's objects, but to a want of the necessary leisure. I have watched with deep interest its progress from the beginning, and will take great pleasure in helping to make it even more useful and successful in the future.

Very truly and fraternally yours,
THOS. BRENNAN.

Dear Sir :—I beg leave to acknowledge receipt of your favor bearing date the 2d inst., by which you inform me that I have been unanimously elected an honorary member of the New York Telegraph Club. I feel much honored by such election, and desire, in accepting the same, to express my thanks for the Club's courtesy, and to convey my wishes for its prosperity and usefulness.

Very respectfully,
W. C. HUMSTONE.

Dear Sir :—I have to acknowledge receipt of your favor of the 2nd, informing me of my election as an honorary member of the New York Telegraph Club. I accept the election with a great deal of pleasure, and trust that the formation of the club will contribute not only to the amusement, but to the well-being of all its members. Yours very truly,
THOMAS T. ECKERT.

Dear Sir :—Your favor of the 21st inst, informing me of the action of the New York Telegraph Club has been duly received and appreciated. It will give me pleasure to receive the certificate of membership at my office, 50 Broadway. Yours respectfully,
A. B. CORNELL.

From Frankfort, Ky.:

Message received. I accept with pleasure the honor conferred upon me by the New York Telegraph Club, and hope some day to meet you all in person.

CHAS. E. TAYLOR.

Dear Sir :—On my return from Europe, I find yours of September 2nd, stating that I have been elected an honorary member of the club. It affords me great pleasure to accept.

Very truly yours,
GEORGE J. GOULD.

Dear Sir :—I am much indebted to the club for my election to an honorary membership, in connection with such prominent electrical lights as you name. Let me know what I can do at any time to promote the good of the club.

Truly yours,
ERASTUS WIMAN.

By telegram from Chicago:

We accept with pleasure, and many thanks for the honor. J. E. PETTIT.

THE MCANEENY CONCERT.—The McAneeny concert which took place Thanksgiving evening at Chickering Hall was, like its predecessor, a great success. The hall was not quite so well filled, which was undoubtedly due to the fact that the event occurred on a holiday, but those who attended were well repaid for their trouble. The Dudley Buck Quartette came in for its share of the well merited applause. Among the artists, all of whom were first-class and well received, were the following: Miss Rosa Penner, contralto solos; Alfred E. Pearsall, recitations; Michael Banner, violin solos; Mrs. Frank J. Johnson, soprano solos; Fred Steeb, baritone solos, and D. W. McAneeny, tenor solo. Almost the entire audience was composed of telegraph people and their friends. Miss Rosa Penner was the recipient of a basket of rare flowers at the hands of her numerous admirers, Mr. McAneeny is to be congratulated upon having chosen this excellent directory of talent.

THE NEEDLES, Cal., Dec. 27.—C. W. Davis, day telegraph operator at Peach Springs, was shot and killed last night near the telegraph office in that place. O. L. Ambrose, the night operator, who is charged with the shooting, has been arrested. There are fears that he will be lynched before the sheriff of the county arrives. The shooting is supposed to have grown out of a fight which the men had yesterday, in which Davis was badly beaten and kicked in the face and head.

"THE BOY SPY."

The delay in supplying the demand for "The Boy Spy," written by Major J. O. Kerbey, of Washington, D. C., has been caused by the failure of the publishers while the book was in press. The *American Library Company*, however, have taken charge of the matter and are now issuing the book as rapidly as possible. The book is one well worth reading. The story is a thrilling one, and as its author was a military telegrapher during the rebellion, every one engaged in the telegraph service should possess a copy. The story contains much telegraphic reminiscence, which makes it of unusual interest to all members of the profession. The plot of "The Boy Spy" is given herewith:

"A BOY SPY IN DIXIE."

There has rarely been published anywhere a story of such absorbing interest as the one which we begin this week under the above title. It is a simple, plain, *true* narrative of a most unusual experience. A boy, who was entering upon manhood when the war breaks out, burns with enthusiasm to serve his country and hurt the Rebellion in some unusually effective way. Being a bright, observing fellow, of good address and enterprising nature, he attracts the attention of high officers of the government, who send him to Montgomery, Ala., where the Confederate Congress is assembling, to observe and report as to what is going on there. He accidentally learns that Fort Pickens is to be attacked, as Fort Sumter was, and hurries off to Pensacola, where he informs himself as to the batteries and plans of attack, and succeeds in making his way into the fort with precious information, which undoubtedly saved it from capture. He has a number or thrilling experiences in this connection. He finally comes North, and is sent by the Secretary of War to Richmond, where he remains for several months, seeing Jeff. Davis every day, and having numerous interesting and some thrilling adventures. After escaping from Richmond he was attached to the headquarters of the Army of the Potomac before Fredericksburg, and rendered highly important services there, and in the raids against Richmond. The entire truth of the story is supported by documentary evidence, by the testimony of military and naval commanders, who were cognizant at the time of the facts.—*National Tribune.*

The price of the book is $2.00. For sale by THE ELECTRIC AGE PUBLISHING COMPANY, 5 Dey street, New York City.

AN ALLEGED NEW SOURCE OF DANGER.

The excitement incident to the destruction of the electric light lines has had a bad effect on a reporter for a daily paper in this city. His imagination has evidently received an electric stimulus, judging from a story with which he tried to shock the public a few days ago. He speculates upon the awful things that might happen were the Elevated Railroads to become charged with the current from electric light wires, many of which are strung under the railroad structure. "Suppose," says the writer, "a stray current from a loose or broken wire should get loose upon the road some day * * * it would not be impossible for a bad shock to be given to a person who chanced to lean against a pillar or other piece of the iron work near where a high tension wire was rubbing against it."

Blessings sometimes come to us in disguise, and who knows but what a catastrophe of the sort just depicted might be one of them? A shock or two of this kind might cure the habit some men have of leaning against lamp-posts and Elevated Railroad pillars at a time when they should be at home asleep.

But this is not all that "might happen." The "rubbing" of a loose wire against the elevated structure "might" easily lead to a disaster more serious.

"A locomotive passing over a spot where a high tension wire was pouring a current into the iron work would undoubtedly get a good-sized portion of the current, and the engineer, with his hand on the throttle and his feet on other iron work, would be doubled up and temporarily paralyzed, if not more seriously hurt. The first effect would in nine cases out of ten be to fling him back, yanking the throttle wide open at just the moment, very likely, when the train ought to be stopping, and if there were a a train just ahead a terrible accident would follow."

Just how the engineer could receive a shock while his hand was "on the throttle and his feet on other iron work," is not explained. It would interest electricians to know. And how the writer figures it out that the engineer, in being "doubled up" in this unceremonious fashion, would yank the throttle open instead of closing it up tight, is another point that requires explanation. Suffice it to say, that the people of New York may rest assured that the Elevated roads are not at all likely to play such a terrible part in the extinction of the human race.

The new Talmage Tabernacle in Brooklyn will be lighted by electricity, and there will be special illuminating effects in connection with the organ, which will be surmounted by a crown of electric jewels, while on the huge sounding-board will be either a lamp or a star in incandescent lamps.

A wonderful electric invention is an automatic stamp to control the payments and receipts in factories, banks and hotels. A company has been formed, with a capital of three millions of francs. It is stated that orders have already been received for about 2,000 stamps in Brussels, Belgium.

The Danish government is moving actively in the question of electrical communication with light vessels, and has in many cases established connection with isolated lighthouses and life-saving stations.

The polytechnic institute at Worcester, Mass., has introduced a new course of electrical engineering, leading to the degree of bachelor of science in electrical engineering.

Texas Siftings: It is the woman who loves to hear herself talk who ought to invest in a phonograph.

Boston Gazette: There is a great deal of sparking done on the electric-car routes.

INGENIOUS USE FOR THE PHONOGRAPH.

Edison's phonograph has found a new application at the Milwaukee College, says the *Sentinel*, of that city. It will be used as an assistant in teaching the French and other foreign languages.

The originator of this idea is Prof. Amedee C. Baillot de Guerville, teacher of French. In cogitating over the question how to make the pupils remember the correct French pronunciation, he concluded to try the phonograph.

A machine was promptly secured, and M. de Guerville went to work at it. He spoke his lesson into the phonograph, and the latter reproduced it with astonishing accuracy. Then he told his pupils that they must study their lessons at the phonograph. No matter whether M. de Guerville was present or absent, the phonograph corrected the pronunciation of the pupils without his assistance.

The effect was surprising, and President Kingsley, of the college, at once decided to procure several machines for the practice of the pupils.

In giving a lesson to his pupils M. de Guerville reads it before the phonograph, at the same time addressing the pupils, and the lesson is reproduced whenever wanted.

"The Application of Electricity to Works and Mills," was the subject of a recent paper read before the South Stafford Institute of Iron and Steel Works Managers at Dudley, England, in which it was stated that there was everything to recommend an electrical transmission plant. Waste heat from blast furnaces could be used miles away; steam boilers could be placed near the colliery to save hauling the coal; the power of a river or stream could be used, and hundreds of horse-power conveyed along small copper wires, while the places could be lighted by electricity at a very low cost.

The Edison Machine Works at Schenectady, N. Y., already employ some 1300 men, and when the extensions are completed probably twice that number will be required. A one-story brick building, 602 x 72 feet, is now being erected, and in it will be made all kinds of wire. A new three-story brick building, 167x50, will be used for carpenter shop, pattern shop, etc. The present wire works will be used for machine work. The company also has under contract a new brass foundry, an iron foundry, and, it is said, a building for the manufacture of glass globes.

A dispatch from Ottawa, Ont., on the 13th inst., quoting Clarence W. Ashford, attorney-general of the Sandwich Islands, says a liberal concession for fifteen years has been granted English capitalists by the Hawaiian government, "providing they lay a cable to Vancouver within two years."

"Them 'lectric currents is a killin' so many people in New York that I won't run any risk with them green currants I put up last summer," said a dear old lady, and she therefore emptied six large jars which had been reposing in the pantry.

Electric lights have been adopted to such an extent in the cities and towns of Guatemala that the importation of mineral oils has largely fallen off. At the capital the use of oil has diminished one-half.

The phonograph has already been adapted to the hand organ. They have the advantage that they can be refilled at very moderate rates.

The Bell Telephone Company has declared a dividend of $3 a share, payable January 15th, to stockholders of record of December 31st.

The hood covering of an electric light has been utilized as a home by a sparrow at Allentown.

ELECTRICAL PATENTS GRANTED DEC. 10, 1889.

416,712. Electrical annunciator; Franklin S. Carter, Burlington, N. J.

416,720. Commutator; J. Allen Dalzell, Hartford, assignor to the Schuyler Electric Co., Middletown, Conn.

416,732. Telegraph transmitter; Orville D. La Dow, Mechanicsville, N. Y., assignor of one-half to Frederick T. Bickford, Washington, D. C.

416,742. Circuit-closing device for matrix-making machines; Caspar L. Redfield, Minneapolis, Minn., assignor by mesne assignments to the Chicago Matrix Machine Co.

416,746. Coupling electric motors; Edwin W. Rice, Jr., Lynn, Mass.

416,754. Telephone Switch; Joseph Sack, Dusseldorf, Germany.

416,762. Induction coil transformer, etc.; Elihu Thomson, Lynn, Mass.

416,847. Hanging device for electric arc lamps; James McLaughlin, Chicago. Ill.

416,862. Electric light support; Benjamin Schardt and William Lutzenberger, Dayton, Ohio, assignors of one-third to Herman Fretzinger, same place.

416,873. Cutting metal by electricity; Benjamin C. Tilghman, Philadelphia, Pa.

416,947. Thermostat; William P. Powers, La Crosse, Wis.

416,971. Electric door alarm: Edwin W. Taylor, Charlottetown, Prince Edward Island, Canada.

417,013. Electrical pipe or metal welding machine; Herbert E. Fowler, New Haven, Conn.

417,018. House telephone exchange; William M. Goodridge, Highland Park, assignor to the Western Electric Co., Chicago, Ill.

417,055. Secondary battery; Chas. H. Logan, Toronto, Ontario, Canada.

417,075. Electric gas lighter; Nelson Newman, Springfield, Ill.

417,088. Method of preparing electrodes for secondary batteries; James K. Pumpelly, Chicago, Ill.

417,089. Compound dynamo-electric machine; Frank B. Rae, Detroit, Mich., assignor to the Detroit Electrical Works, same place.

417.095. Electric conductor; John J. Saville and James H. Winspear, Omaha, Neb.

417,117. Electric indicator for grain bins; Adrial C. Thompson and Horace E. Newton, Quelly Center, Neb.

417,120. Drop-switch for electric conductors; Chas. J. Van Depoele, Chicago, Ill.

417,121. System of switching for conduit electric railways; Chas. J. Van Depoele, Lynn, Mass.

417,122. System of supplying currents to electric railway systems; Chas. J. Van Depoele, Lynn, Mass.

417,158. Secondary battery plate; Victor H. Ernst, Jersey City, N. J.

417,188. Electric danger alarm for railway block signals; James H. Hunter, New York, N. Y.

417,198. Electric gas lighter; Nelson Newman, Springfield, Ill.

It was announced recently that a Catholic church in this city was to be lighted by electricity, and the lamps were to be disposed with a view to giving unique effects. At a conference of priests, however, Archbishop Corrigan made a special request to the rectors that no electric lights be used in Catholic churches until their safety be clearly demonstrated.

The electric cars in use in various cities are believed to be a great help to people afflicted with chronic rheumatism.

President Bates, of the Accumulator Co., says his company received the only gold medal for accumulators at the Paris Exposition.

OBITUARY.

Edward Nicoll Dickerson, a widely-known and eminent member of the bar of New York, died December 13, at his residence in Far Rockaway, L. I., at the age of sixty-five. Mr. Dickerson was one of the most prominent and successful patent attorneys and advocates of the country, and was associated with Mr. Storrow in the famous American Bell Telephone cases. At the time of his death Mr. Dickerson was vice-president of the Electric Club of this city, and had recently delivered a very interesting lecture before the club on the steam engine.

DEATH OF M. W. GOODYEAR.

Miles Watt Goodyear, one of the best known men in the electrical trade in this city, died suddenly of heart disease, on December 15th. Although he had been in poor health for some time, no one ever expected so sudden a termination of his life, and the shock to his friends was great.

Mr. Goodyear had been for over 20 years connected with electrical work and electrical manufacture, commencing with L. G. Tillotson & Company, and remaining with the company when it was changed to The E. S. Greeley & Company, as manager of the electrical department. The deceased leaves a widow, and a daughter aged 19. There will be universal regret in electrical circles over the untimely death of Mr. Goodyear, who was generally liked, and numbered his friends by the score.

Deceased was about 50 years of age, and a prominent Mason. He was also one of the founders of the Electric Club, being a member of the board of managers of the club since its organization in 1886. One of the most distressing features of Mr. Goodyear's death was the disgraceful and shameless manner in which certain of the daily journals in this city jumped at conclusions, which were subsequently proven unfounded, detailing the alleged circumstances of his death. It is one of the most cowardly traits of man to defame and tarnish the character of another after he is dead and powerless to defend his good name. How the editors of reputable journals permit such slanderous stories to be published without question is a mystery.

It is a deplorable state of affairs that a man's character should be blackened for mercenary considerations. This is true in this case as in hundreds of others. When a daily paper is made the instrument of defamation of character, the editor becomes liable for damages. Several papers have retracted what was published in connection with Mr. Goodyear's death. One morning journal, however, *The Press*, has not yet summoned up sufficient courage to publicly acknowledge, in an honorable manner, the error made. Such dishonorable practices on the part of many newspapers cannot be too severely condemned, and we speak for a large clientage in the electrical profession when we enter this, our protest against this last act of disgrace—

> "Man's inhumanity to man
> Makes countless thousands mourn."

STAMPING LETTERS BY ELECTRICITY.—A new letter-stamping machine has been put on trial in the Philadelphia Post-office. It is run by electricity, will cancel about 25,000 letters an hour, and has a register that keeps count of each letter stamped. This machine may do away with the services of a few stampers.

Phonographs are to be put in the post-offices of Mexico, to be used by persons unable to write, in order to send messages to friends through the mails.

Malone Wheless of Washington, D. C., has invented a new electric system which is now being experimented with at the Capitol.

ELECTRICITY IN THE CENSUS.

Robert P. Porter, superintendent of the census, has issued a circular relating to electrical industries. After speaking of the appointment of A. R. Foote as special agent to take charge of the department of electricity, the superintendent says:

It is the purpose of this office, without seeking data which may be irrelevant or unimportant, to make the statistics of this industry complete and accurate, so that its real condition and true importance may be known and understood by the general public.

All persons to whom inquiries may be addressed are assured that the requirements of law, that answers to census inquiries shall be treated as strictly confidential, will be faithfully observed; each employé of the census office specifically makes oath not to disclose improperly that which he ascertains, and severe penalties are imposed for a violation of the obligations to secrecy. Consequently, all persons addressed may have confidence that their compliance with the requests for information as to certain details of their business will in no case be followed, either in the report of the special agent or in the tabulation of results, by the disclosure of matters which they properly desire to withhold from publicity.

The census for 1880 makes no mention of the industry of generating and distributing, from central stations, electric currents for the uses of light and power. The investigation of this industry for the eleventh census will be the first official census report made on the subject in this or any other country.

ELECTRIC LIGHTS FOR CHINA.—The unexpected arrival of two distinguished Chinamen among their countrymen in New York has created a sensation in Chinatown. They are Wong and Fong, both middle-aged men, and they were sent here, it is said, by a wealthy syndicate of Canton merchants to buy electric light plants for the Empire of China. Wong and Fong told a reporter recently that the sydicate has secured a ninety years' contract with the Imperial Government to furnish all the public buildings and offices with electric light. It also owns the exclusive right to supply the rest of the empire with the light. Wong and Fong are stockholders in this new enterprise and came here to purchase the necessary machines to supply only the largest cities of China, Hong Kong, Foo Chow, Shanghai, Nanking, Hankow, Ning Po, Tientsin and Pekin. They brought a large bill of credit with them to the rich firm of Wing Wah Chong & Co., importers.

THE OVERHEAD ELECTRIC LIGHT WIRE QUESTION.—In Cleveland, Ohio, and Minneapolis, Minn., as well as in New York city, the overhead electric light wire question holds the attention of the citizens. In Cleveland the authorities are forcing the settlement of the matter by chopping down the poles and destroying the lines. In Minneapolis, however, there is a disposition on the part of the authorities to regard the rights of the electric light companies.

A press dispatch from Pittsburgh, Pa., says: A new system of electric arc lighting has just been invented by the Westinghouse Electric Company, and will be exhibited for the first time on the streets here within a few days. The system is an entire departure in many respects from any arc-light apparatus existing. The dynamo differs materially from other arc-light machines, and has special improvements in the way of safety, economy and efficiency. The present arc-lamp carbon will not burn more than ten hours. The new Westinghouse lamp will last forty hours, or about three nights. There is also a safety device connected with the lamp which allows a person to touch the wires anywhere without giving anybody a shock.

ELECTRIC LIGHTING IN MEXICO.

Mr. Theo. Plate, President of the Interstate Gas and Water-Works Co., of St. Louis, has recently secured franchises extending over long terms of years for erecting and operating incandescent electric light plants in the cities of Durango and Aguas Calientes, Old Mexico. In both cases the franchises are accompanied with contracts for lighting the streets and other public places. In Durango, the authorities use 200 32-candle power lights, and 150 16-candle power lights, and at Aguas Calientes, 150 32-candle power lights and 175 16-candle power lights. These lights are to be operated in the neighborhood of 240 hours per month. The Heisler System of Long Distance Incandescent Lighting has been adopted for these plants, and orders have been placed with the St. Louis office of the company for complete outfits of central station apparatus. The plants will be models in every way, and on account of the high cost of fuel, compound condensing engines of the high speed type will be used. The plants are to be in operation in time for the annual festas, which take place early in the spring. Mr. Plate and his engineer, Mr. Andrews, left for Mexico on the evening of the 21st of Dec. to begin active operations.

WABASH, Ind.—It will be remembered that the city of Wabash, Ind., was among the first to adopt the plan of lighting by arc lights on towers. This system was a few years ago displaced by the Heisler Incandescent System, and the lights distributed all over the city. For some time this plant was operated solely for public and domestic lighting, but a demand having sprung up for incandescent lights for commercial and domestic lighting, the company has decided to make considerable enlargements and have placed their order with the Heisler Electric Light Co., of St. Louis, for one of their latest improved dynamos, having a capacity of 350-32 C. P. lights.

HOLDEN, Mo.—The City Council of Holden, Mo., has granted a franchise for electric lighting to Mr. Theo. Plate, president of the Holden Water Company. The franchise extends for a long term of years and includes a contract for 32-candle power lights. The plant will be operated in connection with the water-works. Orders for the necessary electrical apparatus have been placed with the Heisler Electric Light Co., of St. Louis, whose long-distance system will be used. It is intended to have the plant in operation by the middle of December.

Superintendent Morris Mead, of the city bureau of electricity, Pittsburgh, Pa., is completing a system of signals whereby the entire police force can be instantly notified of an alarm. The signals consist of a flash of light at night and semaphore arms for use during the day. One of these signals will be erected in a few days at the corner of Seventh Street and Duquesne way, where it will be given a practical test. By the use of this system it will greatly lessen the escape of people who desire to leave the city after committing crime.

Mr. A. A. Knudson, the well-known electrician, formerly of this city, but now of St John, N. B., suggests for a feature of the World's Fair a sort of modern and American edition of the hanging-gardens of Babylon, with a horseshoe-shaped waterfall 160 feet high, the height of Niagara, pouring from one of its sides. Electricity is to bear an important part in the scheme.

The Heisler Electric Co., of St. Louis, have decided to change their standard lamps from 30 to 32-candle power, and from 15 to 16-candle power, thus falling in line with other manufacturers in this respect.

A crossed woman is nearly as dangerous as a crossed electric wire.

BIOGRAPHICAL SKETCHES OF PROMINENT TELEGRAPHERS.

MR. MORELL MAREAN.

We present to the readers of the AGE the photograph of a gentleman distinguished among the profession, not only by his official position, but by his thoroughness as an electrician, unsurpassed in its deep mysterious entanglements, and possessing executive qualities of a high order.

MOREL MAREAN.
MANAGER OF THE WESTERN UNION TELEGRAPH OFFICE, WASHINGTON, D. C.

Morell Marean, the present manager of the Washington office, was born at Harford, Susquehanna Co., Pa., in 1842. He studied telegraphy in the office of the D. L. & W. R. R., at Montrose Station, Pa. As operator and agent he was employed along that road from 1858 to 1861, when he accepted a position as operator with the old American Telegraph Company in Washingtone In 1864 he was made night chief operator. H. was almost immediately promoted to day chief, acting as assistant manager. This position he maintained until 1870, when he was made night manager of the W. U., the consolidation of the American and W. U. having taken place in June, 1866. In 1873 he was made assistant manager to Captain Whitney, now deceased. In 1884 he was appointed manager, which position he now holds.

Mr. Marean has done some very efficient and praiseworthy work, both for the company and its patrons. He assisted in restoring the broken circuits, at the great fires of Baltimore, Chicago and Pittsburg. He had entire charge of the press service at Long Branch and Cleveland during President Garfield's illness and funeral. He had charge of the Morse Memorial, in the House of Representatives.

Upon the opening of the New Orleans exposition in 1884, Mr. Marean took entire charge of the telegraphic arrangements, and demonstrated to the country what wonderful things have been accomplished with electricity. For his valuable work to the management of the exposition Mr. Marean was presented with a handsome ring, bearing the following inscription: "Morell Marean. From the Board of Management, in appreciation of his efficient services at White House, in opening by electricity the World's Exposition, New Orleans, Dec. 16, 1884."

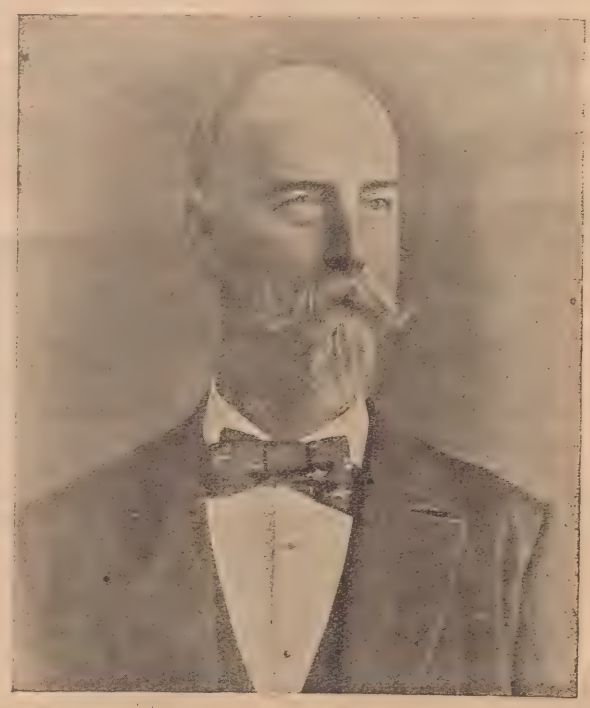
WILLIAM H. YOUNG.

There is not in the profession a more widely-known or popular gentleman than Mr. William H. Young. the present night manager of the Washington Western Union office. Mr. Young was born in the city of Washington in 1838. He entered the profession as messenger in the Washington and New Orleans Telegraph Company's office in this city in 1854, at which time Hon. Ames Kendall was president and Mr. Jos. B. Tree, local manager. In conection with the duties of messenger, he being the only one, he acted as janitor, assistant batteryman and lineman. With characteristic pluck and energy he soon graduated as operator and accepted a position with the Magnetic Telegraph Company, remaining with them until their consolidation with the old American Company. With the exception of six months, during 1856, when he was in charge of the B. & O. at Moundsville, W. Va., Mr. Young has been in Washington.

In 1861 he was appointed chief operator of the American Company, a portion of the time acting as censor.

In 1864 he was appointed assistant manager of the United States Company by superintendent P. Westervelt and appointed manager of the Bankers' and Brokers' Company, in 1866, by superintendent L. H. Smith. He remained with that company until 1871, when it was purchased by the Western Union Telegraph Company. He accepted a position as assistant chief operator with the latter and was shortly afterwards promoted to chief operator. He is now night manager.

Mr. Young is vice president of the Telegraphers' Mutual Benefit Association, and is one of its hardest working agents.



WILLIAM H. YOUNG.
NIGHT MANAGER OF THE WESTERN UNION TELEGRAPH OFFICE, WASHINGTON, D. C.

He studied telegraphy under Alfred Vail, at Washington, in 1845, and was associated with Samuel F. B. Morse and J. D. Reid in the building of the first telegraph lines. It is said that he constructed the first instruments actually used on a practical telegraph line. Upon the completion of the New York and Washington line, in 1846, he became manager of the terminal office at Jersey City.

Messages for New York were received there and brought across the river by messengers. A wire was afterwards strung across the river, mid-air, but storms rendered this method of communication uncertain. After the insulating properties of gutta percha had been discovered it became possible to reach New York by telegraph through a wire under the river. Then Jersey City lost its importance as a terminal office, and Mr. Smith resigned and went into the service of the O'Reilly Company, which was building lines from Philadelphia west. In 1861 he was one of the four incorporators of the Independent Telegraph Company, which was the predecessor of the United States Company, a corporation which, by the use of the expired first patent of Prof. Morse on the general system of electric telegraphy, was able to make itself so formidable to the old lines that when, in 1866, the expiration of Morse's local battery patent threw the whole business open to it, the old lines were forced to consolidate with it.

Mr. Smith then became New York manager of the New York and New England Telegraph Company, and when, in 1869, the American Telegraph Company absorbed the New York and New England, Mr. Smith was assigned to manage the New York office in the old telegraph building at the opposite corner of Wall and Broad streets. The American Company's business had been done with House printing telegraph machines, and operating was not much of a science. Mr. Smith brought over with him a corps of young operators who had learned to send with a key and to read by sound, and the printing machine men were astonished to discover that Mr. Smith's operators could beat them in rapidity and equal them in accuracy. Reading by sound was a new thing in telegraphy in those days.

Mr. Smith remained New York manager of the American Company for several years, and then joined with others in the construction of the Southern and Atlantic Telegraph Line, of which, after its completion, he became superintendent. The consolidation of this with the Western Union, in 1876, left him out in the cold, but a place was made for him as steward of the Western Union dining-room.

Mr. Smith, in spite of his fondness for experimenting in telegraphic science, had never made any money out of his devices. He always claimed that he invented the "climbers," or spurs that linemen use in ascending poles, but never took out a patent on them. It is also said that he invented the "lightning arrester."

Mr. Smith's long service in the building had made him familiar with almost every one in it. He was the especial intimate of the old fellows in the executive and other offices, who, many of them, had known him for thirty or forty years, and had regarded him as a veteran ever since they came into the business themselves.

He was a scrupulously honest and upright man, and while the familiar figure will be missed, the memory of his pleasant face and kindly manner will live undimmed in the minds of those who knew him until they, too, shall pass off the stage of earthly existence.

THE LATE CHAS. T. SMITH.

In our last issue a brief notice was given of the death of Charles Tappan Smith. The story of his relations with the telegraph from its earliest days up to the time of his death is so full of interest that it is worth relating. Space, however, forbids more than a sketch.

Charles Tappan Smith was born in Portland, Maine, 69 years ago, and was at the time of his death the oldest operator in service in the United States. His entrance into the telegraph service ante-dated that of Mr. James D. Reid, familiarly called the "Father of the Telegraph," and now U. S. Consul to Dunfermline, Scotland.

Mr. Walter P. Phillips and Chas. H. Bogle were invited guests at the opening of the Auditorium, Chicago, recently. They were highly pleased with their trip.

Mr. J. d'Infreville, for the past eight years electrician for the Western Union Telegraph Co., New York, has opened an office at 110 Liberty st., this city, as an electrical and consulting engineer.

The smartest Aleck in the world is Electricity.

CORRESPONDENCE.

WASHINGTON POSTAL NOTES.—Business has shown a steady and healthy increase for the past two months. Southern points are fairly well supplied with through facilities, but some business is being relayed here, and this class of work will naturally increase as the months go by. The copper wires of the Postal afford more successful quadruplex circuits than any other opposition company ever had. The standard underground system, which is about two miles long, and through which all the main line wires—north and south—pass, has been in successful operation for some months. Three full quads are worked days, and three additional duplex circuits nights in this office, besides single circuits. The event of this season with us was the quiet stealing away of our night chief, George W. Ribble, to Harrisonburg, Va., where in the beautiful Shenandoah Valley he had wooed and won, and now claimed as his own, one of Virginia's fair daughters, Miss Annie Patterson. Mr. and Mrs. Ribble received a number of tokens of regard and well-wishes on their return. The avoirdupois of the force has been very materially increased by the addition of Messrs. Robert Herron, J. H. Lounsbury and W. S. Maple to our force. All three of these gentlemen are so well known that further remarks would be superfluous. A number of receiving operators will get "warmly" aequainted with them before the statesmen leave the Capitol next summer. General Superintendent J. H. Emerick paid us a call last week. Chief Operator Roland, of the Norfolk Postal office, called on us a few days ago, Also Mr. Martin, of the Postal force at Wakefield-Va. Dr. Burck, who has been rusticating in Maryland for some months, is in town and somewhat improved in health. Branch forces will receive our attention next time.

WINNIPEG NOTES.—W. A. Dier has resigned to return East. Messrs. Kane and Decow have been made happy by the arrival at their homes of a fourteen-pound boy and a ten-pound girl, respectively. G. B. Fraser passed through here on the way from Port Arthur to Swift Current. C. McGarvie, of Swift Current, is in the city consulting a physician. He has not been well of late, but we are pleased to see great improvement in him in the last few days. A picture of the staff here is the latest adornment to the operating room. Mr. Harry Bertram has charge of the C. P. R. office at Clarendon Hotel here, in connection with the book stand. It is pleasing to hear Harry's reminiscences of old times, when the W. U. was in its infancy; also the hair-breadth stories of his adventures while a member of the Telegraph Corps during the war. The Queen's Hotel office is managed by Mr. Tom McIntosh, who has been there for years. He is well known all over the country. Tommy has hosts of friends and is very popular. The trouble at Vancouver seems to be at an end, as the staff at that point is again complete. We regret to learn of the illness of Mr. Muth's sister in California, for which place he left Donald two weeks ago, but a message from him lately reports an improvement in her health. The Great Northwestern Telegraph Co. have opened an office at Carberry, Man, and are doing a good business there. The Brandon branch of the N. P. and M. R'y will soon reach that city, and the G. N. W. expect to open offices on this line at the most important points for telegraph business. The boys here send Xmas greetings to all members of the fraternity from the Atlantic to the Pacific 73s.

SAN FRANCISCO NOTES.—For a month past workmen have been busy tearing out partitions, painting, plastering and rearranging tables, so that now the office presents a more pleasing and comfortable appearance. A long-felt want has been supplied in the shape of a roomy closet for every operator; a great improvement over the old coat room. A lunch room is also to be established soon on the same floor as the operating room. The Morse force now consists of about fifty, and the Wheatstone twenty operators. Of the Morse force, W. J. Martin is day chief; H. S. Converse, night chief, and G. Q. Stewart, all-night chief. F. G. Dickinson attends to the switch days. J. G. Hafky is day, and R. W. Gillette night traffic chief. Following is a list of the regular force: Days—W. J. Kirkwood, John O'Brien, Geo. Ward, J. McGinniss, E. R. Fisher, D. J. Dooley, J. F. Dooley, S. T. Davidson, T. J. Baldwin, Ed. G. Folger, Jos. Gallagher, A. W. Mott, Thomas H. Martin, T. H. Brown, D. Allen, B. F. Reilly, W. F. Traphagen, A. S. Hale, W. I. McGuire, Clarence Vincent, D. I. Giles, W. J. Hearsch, Miss M. Sanquist, Mrs. Dozier, Miss M. Rood, Mrs. J. F. Dooley, Miss A. Heath, Miss A. Nicholson, Miss N. Horton, Miss Fannie Hoffmann, Mrs. Flemming, Miss A. Green, Mrs. Beardslee, Miss Lou Collins and Miss A. Birtch. Nights—J. S. Hunt, Jeff. M. Prentice, R. E. Geistlich, Wm. Cohn, Frank D. Concanon, C. R. Hagans, J. G. Decatur, Geo. Leitch, S. K. Dyer, A. S. Howe, C. Willoughby and Frank Howard. All night—H. M. Graham. Wheatstone force: S. H. Strudwick, day; Geo. F. Wilson, night chief; J. P. Tonsor, machinist. Days—Wm. Clancy, W. C. Murdoch, T. J. McDonald, R. Pillow, D. Shea, Miss Bean, Miss Foster, Miss Griffith, Miss Kelly and Mrs. S. H. Strudwick. Nights—T. J. Moyer, T. O'Connell, F. W. Regan, T. R. Simpson, W. B. Smith, W. H. Wilson and Miss Hill. Transfers—F. M. Cuyler, New Mexico; Ed. McManimon, Peterson, Utah; Oscar Gibbs, Illinois; Miss A. Collins, Petaluma; Miss Jennie Hall, San Jose; W. P. Hunt, Reno, Nev.; T. J. Edstrom, Denver; J. T. R. Auston, Portland, Oregon; Ike Onyon and G. M. Lawrence to the C. P., for Southern Pac.; Robt. Moore, Portland. The extra list is quite long at present. W. G. Steininger has gone to Washington State to take up a Government timber claim. D. A. Kenney, an operator employed by the Western Union at West Oakland, was run over by a passenger train and killed at that place December 1st. The remains were sent to Topeka, Ks., where relatives reside. Deceased was 29 years old. Miss Hattie B. Donahue, who has been employed as operator by the Western Union at Reno and Virginia City, Nevada, San Francisco and Sacramento, fell from the railroad bridge into the Sacramento River, at the latter place Dec. 4th, and was drowned. The body was recovered about two hours later and buried at Sacramento. Miss Donahue was well known in this city and her death was a surprise and a sad blow to her many friends here. It will probably be interesting to former residents of this city to know that the force still makes its headquarters at the Brooklyn Hotel.

KANSAS CITY NOTES.—Mr. Anderson and Richard Evers have gone South; Mrs. Wadsworth to Russell, Ks., for the U. P. R'y. Grant L. Hoff, of the day force, has been sick for some days, with jaundice, but is recovering. Mr. Edward Moore has been ill for some time, but manages to be on duty, Mr. Ward having exchanged tricks with him for ten days, Ward going on nights. W. Flynn and Dick Evers have also exchanged tricks temporarily; Flynn has been on the night force since his return from Denver. Chas. Bierschmitt has been transferred from the 8 to 5 to the 8.45 to 5.45 force. Miss Elston, who works Ottawa wire, has been quite ill with malaria for some days. At last accounts she was improving. H. B. Logan, of the Deming "duplex," had his wrists severely sprained a short time since by taking a "header" from his bicycle, the machine slipping on a wet sidewalk. R. S. Ayers, the newly elected Sheriff of Garnett, Kansas, at which point he was operator for several years, a few days since paid a visit to his friend, Mr. Cutler, our genial way chief. Jno. J. Sullivan, one of the old-time operators in this office, died suddenly of heart failure, a few days since, and was buried last Thursday. Quite a number attended the funeral. Mr. Sullivan was one of the best known operators in the city, and much sorrow is expressed at his untimely demise.

If the lady and gentleman who have been making a practice of "cribbing" some one of the subscriber's papers each issue, do not stop the practice at once, their names will be published in the AGE. They will be watched.

Mr. B. C. Elder, who has been with us for some months, has left to go with the Postal Tel. Co. in this city, as traffic chief, days.

KANSAS CITY POSTAL NOTES.—Mr. Watson has gone to western Kansas for the Union Pacific. The position of traffic chief has been created and Mr. B. C. Elder has been appointed to fill the place.

ST. JOHN, N. B., W. U. NOTES.—On the 1st, Mr. J. I. Robinson, of the receiving department of the W. U., was appointed Cashier in the C. P. R. office. Mr. Robinson had been with the W. U. since boyhood and was one of their most popular and faithful employees. Mr. C. A. Shamper, of the operating room, was transferred to the receiving department to fill the vacancy. There are only three men, including the chief, on the day force of the W. U. here now, the remaining six or seven positions being filled by ladies. C. P. R. Notes.—The C. P. R. Tel. Co. are preparing for the additional wires that are being strung to Halifax and Canso, N. S. Electrician W. J. Camp is setting up two quads, a polar duplex and a set of Milliken repeaters here. A new 24-wire spring jack switch board has also been put in. It is expected three or four more men will be added to the force in a short time. Connection will soon be made at Mattawamkeag, Me., with the C. U. Co.'s wires, which will give the C. P. R. direct communication with Bangor, Portland and Boston.

HELENA, MONT., NOTES.—Hemmed in by mountains and seldom heard of through the columns of the AGE, this is one of the most important telegraph offices in the United States. Occasionally it is the only means of communication between the East and West, for although all other routes may fail, this one can be depended upon. The rapidly growing Northwest was beginning to outgrow the facilities, when the W. U. began the construction of a copper wire from St. Paul to this city, which will be quaded and in operation in a few weeks. One of the biggest "roasts" we have ever seen is the St. Paul duplex. Distance "cuts no figure" in rapid transmission over this wire. As many as 800 messages have been handled between 8 a. m. and 5.30 p. m. At night this wire is cut through to Chicago, and about the time New York people are preparing for their day's work we get to the bottom of the pile. During the first week of the legislative wrangle a great deal of special was filed for eastern papers. Two or three enterprising journals sent correspondents here to report the situation fully. J. Swan is manager; Geo. Smith, day chief; Geo. Tilly, night chief, assisted by W. Taylor. All of these gentlemen are hard workers and very popular with the boys. The operating force consists of the following: J. W. Dudley, Frank Kyle, J. S. Colfax, J. Anderson, L. P. Grover, W. B. Scoffin, W. S. Rainier, E. B. Detwiler, H. M. Cormack, C. E. Smails, J. O. Shunk, B. F. Hartz, A. Cullen. Mr. Detwiler is night reportman, having recently relieved George Stewart, who went to Missoula to take report. Owing to the increase of business and additions to the force the past year, we are somewhat crowded for room, but Mgr. Swan expects to find better accommodations soon. He is making it as comfortable as possible for the present, having lately substituted incandescent lights for poor gas. Mr. Smith interested himself in raising a fund for the families of Messrs. Miles and Igoe, and the result showed the liberal charity of Helena operators.

At the office of the Rocky Mountain Telegraph Co. C. W. Ridgway is manager; J. A. Torrance, night chief; and J. Richards has charge of the repairs. This company connects with the Postal, and is contemplating an extension of its lines throughout the Northwest. At the different railroad offices a large force of operators are employed who will be mentioned later.

PROVIDENCE NOTES.—The Old Colony R. R. have fitted up a new office in the depot here, consolidating the Western Union depot office and the R. R. office. Miss Laura Harry manages W. U. affairs, while Miss Belle D. Fiske has charge of Old Colony interests and makes it the prettiest little office on the road.

SEEING TO A DISTANCE BY ELECTRICITY.

A correspondent of *La Lumière Electrique* thus comments upon M. L. Weiller's paper which appears in *Le Génie Civil*, vol. xv., p 570:

The writer endeavors to solve the important question of vision to a distance by electricity, by means of a combination consisting of a selenium cell, a gas telephone and revolving mirrors, forming a special apparatus which he designates a phoroscope, and which we will briefly discuss.

The question of vision to a distance by electricity is governed by the two following fundamental principles. In order to get the impression of the form, outlines and details of one or several objects, it is not necessary—1. That the eye should receive all the rays proceeding from it. 2. That it should receive at the same time, the luminous rays necessary for vision.

Some very simple examples will demonstrate the first principle. We can see an object very clearly through wire gauze, and the image is perfect if the interstices are large and the wire fine. Carpets and mosaic seen at a certain distance do not seem to be formed of a number of parallel lines, or by the juxtaposition of little stones. An engraving, a picture, and especially a chromo-lithograph, show at a distance no discontinuity in the work, although the engraving is composed of lines and the chromo-lithograph of separate little dots.

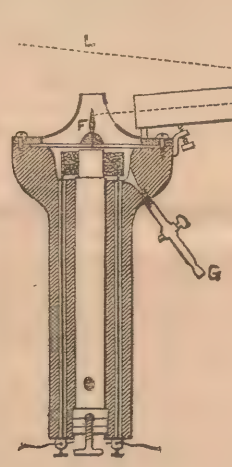


FIG. 1.

L, lunette; F, flame; G, gas; Gl, glass.

We see thus that it is possible to have a sufficiently clear perception of an object by the vision of a system of more or less luminous lines forming a kind of pattern.

The second principle is quite as well-known and as deduced from the duration of the luminous impressions upon the retina, a period of about $\frac{1}{10}$th of a second.

A series of impressions succeeding one another in a very short time produces the effect of simultaneous impressions, and it follows that in order to perceive the image which we have called the pattern, it is sufficient to receive the luminous impressions of the different lines that constitute it in an interval of time less than $\frac{1}{10}$th of a second.

It was by taking this principle as a basis, that Lissajons studied from an optical point of view the vibratory movements of bodies. His experiments are so well-known that we need not enter into them here. Lissajons' curves are produced in a rectangular portion of a picture. If, on the other hand, this object possesses the power of lighting, all the rays proceeding from the space occupied by the curve will, in an excessively short space of time, converge at one point after having been subjected to a double reflection on the mirrors of the two tuning forks that were employed for this experiment.

We may substitute for these forks any movable system whatever, bearing a series of mirrors arranged in such a manner that the displacement of each of them brings upon the same straight line all the rays projected from a portion of an illuminated object. Let us suppose these mirrors to be placed on a circle turning upon an axis perpendicular to its plane, and each of them making a different angle near 90° with this plane. To each mirror there will be a corresponding series of parallel lines in the picture, and if the rotation is sufficiently rapid all the rays proceeding from the object represented in the picture will meet at the same time, in as short an interval of time as required. It is thus possible to bring to one point all the luminous rays proceeding from a pattern, and each portion of the image thus producing its impression upon the retina in succession, it is sufficient that the interval in which these impressions succeed one another, should be sufficiently short for them to be rendered simultaneous.

The transformation of the luminous waves into electric currents is performed by means of a radiophonic receiver forming part of an electric circuit. This receiver may be a cell of selenium lamp-black, hydrogenated palladium, etc., the resistance of which varies with the quantity of light received. The different portions of the pattern will act differently according to the quantity of light emanating from them and in an interval of time less than $\frac{1}{10}$th of a second; the variations of resistance of the circuit will correspond to the image observed.

In order to solve the opposite problem, *i. e.*, to extract this image from the circuit at the receiving station, the writer proposes to employ

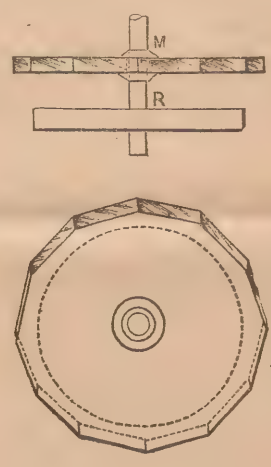


FIG. 2.

M, mirrors; R, regulator, 30 revolutions per second; 300 glasses on the side instead of 12.

the gas telephone, which is an instrument of extreme sensitiveness. It consists of an ordinary telephone (fig. 1) in which the portion comprised between the plate, bobbin and the inner sides is in communication with a gas pipe; the vibrating membrane is pierced in the centre with a little hole, through which escapes the gas which is lighted; this little flame will undergo a variation of brilliancy at each movement of the membrane, and it will produce a continuous succession of rays similar to those arriving upon the radiophonic receiver. In order to show them and form an image similar to the pattern, a system of mirrors is employed (fig. 2) similar to that used at the first station, but acting in the reverse way. It is evident that these two apparatus must act synchronically like the Hughes and Baudot regulators employed in telegraphy.

Station 2 will reproduce upon a sheet the lines taken upon the image at station 1.

The writer gives the name of phoroscope to an apparatus of this description, the different parts which we have described being combined according to the plan shown in fig. 3. The image that we wish to transmit is broken up into a series of parallel lines, the different points of which act in succession upon a selenium cell making the intensity of the current connecting the two stations vary. These variations in electrical intensity are transformed by the gas telephone into variations of luminous intensity, and the successive changes of brilliancy of the little flame are projected upon a sheet at points corresponding to the various points of this sheet.

Theoretically, nothing can prevent this double transformation of luminous intensity into electric intensity, but the realization of the experiment is surrounded with difficulties which make us fear that it will be long before a practical phoroscope is produced, but this should not discourage enterprising and persevering physicists.

FIG. 3.

L. W., line wire: R. W., regulator wire; L1, L2, lenses; M, mirror apparatns; R, regulators; O. object; I, image; S, selenium transmitter; C, commutators; G, gas; T. R., telephone receiver; E, earth.

A Victory for the Brush Company.—On Dec. 25, at Indianapolis, Ind., Judge Gresham decided a case of general interest to those connected with electrical matters. It was a suit brought by the Brush Electric Company of Cleveland against the Fort Wayne Electric Light Company for infringing the Brush patent upon the so-called double carbon lamp. The case has been vigorously prosecuted and defended, and has been pending about three years. All of the claims of the Brush patents are sustained. The patent was attacked by the defense mainly upon the grounds that its claims were too broad and sweeping. Electric lamps controlled by this patent are in use throughout this country and, in fact, the world over wherever street lighting by electricity is had.

At Troy, N. Y., a temporary injunction has been granted to the Hudson River Telephone Company against the Watervliet Turnpike and Railway Company. The telephone company seeks to restrain the railroad company from operating its cars by the single-trolley electric system A motion to make the injunction permanent will be argued at a special term.

The John A. Roebling's Sons Company have accepted the agency for McIntire's electric wire connectors and terminals.

A New Insulating Substance.—A product resulting from the treatment of asphalt with sulphuric acid, which has hitherto been considered of no value, has, says *La Lumière Electrique*, been found to furnish an excellent insulating material. This substance, which resembles ordinary asphalt, becomes, after exposure to great heat, as hard as ebonite or vulcanite and possesses high insulating properties.

At a special meeting of stockholders of the Thomson-Houston Electric Light Company, in Middletown, Connecticut, Dec. 22d, it was voted to increase the preferred stock $3,000,000, making a total of $4,000,000 preferred stock and a total capitalization of $8,500,000. The price will be decided by the Board of Directors.

The big engine at the Montpelier (Vt.) Electric Light Works is now in running order. A coffer-dam is being built in the Winooski River, to assist in setting up the new water wheels. The new dynamos are being placed.

William E. Gilmore has been appointed secretary of the United Edison Manufacturing Co., *vice* J. Hutchinson, who is now assistant general manager of Bergmann & Co.

The Westinghouse Machine Co. is to erect a brick and stone building in Pittsburgh, Pa., to cost $40,000.

THE ESSICK PRINTING TELEGRAPH CO.

While in the office of the above company, at 169 Broadway, a few days since, we were a witness to the following transmission over a Boston circuit of the Empire and Bay State Telegraph Co., the circuit being worked at the New York end by Mr. Abner McKinley, the treasurer and general manager of the company, and at the Boston end by a young lady, neither of whom are conversant with Morse characters.

New York. Dec. 24.

Miss Mooar: Please send J. B. Taltavall, editor of the ELECTRIC AGE, a message. Do it up in fine shape. A. McKinley.

Boston, Mass., Dec. 24.

To J. B. Taltavall, Esq., Editor ELECTRIC AGE:

This is a specimen of the work of the Essick Page Printer over a single line of wire from Boston to New York, a distance of two hundred and eighty miles.

The instrument is an electrical type-writer, by means of which the message is printed in page form in the presence of the transmitting operator, and a duplicate is printed at all receiving stations on the line, whether the circuit be long or short.

If you were to place an Essick transmitter on the floor of the New York Stock Exchange, the quotations might be sent to all subscribers, whether in New York, Boston, Chicago, or at any other point in the circuit, by a single transmission. Yours truly,

N. E. Printing Telegraph Co.

[The above was in the form of typewriter letters.]

It is said that Miss Mooar has attained by this system a speed of 25 words per minute. The keyboard resembles that of a typewriter, and it is operated in much the same manner.

SING SING, Dec. 26.—The electrical execution machines at the State Prison were tested to-day by a committee for the State, composed of Dr. Carlos F. MacDonald, Dr. A. D. Rockwell, Dr. P. H. Laudy and electrical assistants.

The Grand Jury, Dec. 27, found an indictment for manslaughter against Charles W. Pierce, Superintendent of Lamps of the Brush Illuminating Company. He is charged with causing the death of Henry Harris, the Eighth avenue dry-goods clerk, who received a fatal shock from an electrical wire, Nov. 30.

Mr. E. T. Gilliland, president of the Electric Club of this city, has resigned on account of ill health. Mr. Gilliland goes south to recuperate. General O. E. Madden has been unanimously elected president to fill the unexpired term.

Jerome Hennessey, superintendent of Telegraphic Construction at San Juan del Norte, Nicaragua, committed suicide by shooting himself on November 22d. Hennessey had been suffering from fever for some time.

The United States Electric Lighting Company of Washington has recently authorized an increase of its capital stock from $500,000 to $700,000. Notwithstanding the extraordinary outlay which the company has been compelled to make in changing its lines from poles to conduits, it has continued to pay six per cent. dividends. It is expected that a large increase in the number of public street lights will be made, provided legislation permitting the necessary extension of underground wires is not impeded. About six miles of streets are now lighted by arc lamps which have displaced 460 gas-lamps. Owing to the natural growth of the city, the improvement of new streets, and the education of the people up to a higher standard of illumination, the number of gas-lamps has not decreased. The number now in use is 5,500. The local company is making strong efforts to secure contracts for lighting the more important government buildings, while isolated plant advocates are not unmindful of the advantages which may be gained from active work in that direction.

A POSTAL TELEGRAPH BILL.—Mr. Cullom of Illinois, in the Senate, and Mr. Bingham of Pennsylvania, in the House, have brought in a bill establishing a postal telegraph service. The measure authorizes the Postmaster-General to contract with any existing telegraph company for the use of its lines for postal messages between free-delivery offices. The Postmaster-General is to decide the extent and location of the proposed service, and to fix the rates, which are to be prepaid by stamps. The telegraph messages are to be delivered by the regular carriers at the first mail delivery following and "at such other times as the Postmaster-General may direct."

The representative of the Westinghouse Electric Company in Texas, has secured a contract for alternating current apparatus for a central station plant of 500-lights capacity at McKinney, Tex. The Westinghouse Electric Company operates now fifteen central station plants in Texas.

Sacramento is having a fight with the local gas and electric light company over the moving of city lights. The municipal corporation threatens to put in a plant of its own if the local company refuses to move the masts as required by the city authorities.

The San Antonio and Aransas Pass Telegraph Company has been organized in San Antonio with a capital of $200,000. The officers of the new company are the same as those who manage and control the San Antonia and Aransas Pass Railway.

A new company with a capital stock of $10,000 has been incorporated to build a telegraph line from Mott, Siskiyan county, Cal., to the Oregon line, to be called the Eastern Union Telegraph Company.

Articles of incorporation have been issued to the Calumet and Michigan Telegraph Company, at Chicago, to construct and maintain a line for the transmission of all kinds of electric signals.

A brick, stone-trimmed electric light central station, at a cost of $30,000, is to be built for the Thomson-Houston Co. at Cincinnati, O.

Bay City, Mich., has an incandescent plant. A 1,000-light Thomson-Houston alternating dynamo has been installed and is giving satisfactlon.

An electric light plant will be installed at Eureka Springs, Ark , by a St. Louis Gas Company. An incandescent system will be introduced.

Contracts have been awarded for machinery for an electric light plant at Eagle Pass, Tex., by a newly organized electric light company.

Col. S. H. Taylor has closed a contract with the Santa Rosa Thomson-Houston Electric Light Company for a 650-light alternating plant.

Santa Cruz., Cal., is now lighted by the incandescent system and there is general satisfaction therewith.

HOW I PLAYED MESSENGER-BOY.

Prize Story No. Four.

I began my career as a te'egrapher, as "manager" of a small delivery office on the outskirts of B—— (a thriving city). I had there a messenger-boy who had a habit of going home several hours before closing time, and leaving me in the lurch, so that I was often obliged to deliver the messages myself, and I had many an amusing experience while performing this duty. My writing, in those days, resembled the tracks that a fly, just emerged from an inky bath, would make if allowed to crawl over the paper, and it was no infrequent occurrence for me to have irate customers rush into the office and request me to decipher my own scrawl, if such a thing were possible; but withal I was very proud of it, and ornamented (?) it with many flourishes. One dark night I went to deliver a telegram to a Mrs. De-Forest on D—— street. I handed in the book to be signed, and waited outside, as I wished to remain *incognito*.

"Dear me!" exclaimed a feminine voice from within, "I cannot make out a word of this writing; Blanche, come here a moment and see if you can read this." A pretty young ady appeared and, after scrutinizing it carefully, was obliged to admit that it baffled her. "Little boy," said she, stepping to the door, "can you tell me what this reads? The writing is very poor and I cannot make it out. Please step inside a moment." I had often seen this young lady pass the office and had devoutly wished that I might be numbered among her friends, but now that I stood in her presence (such is the perversity of human nature) I did not seek to make a good impression and thus pave the way for a subsequent friendship, but was thankful for the cover of darkness which rendered me invisible as long as I remained outside. Fortunately, I remembered the exact wording of the message, and adopting as well I could the nasal drawl of my messenger-boy, I told her the contents of the telegram.

"You have a remarkable memory for a messenger," she said. "Does the operator read the telegrams to you before sending you out, so that you can decipher them when ca'led on?"

"Yes 'm," said I, meekly.

"An excellent idea," she continued. "It is, without exception, the poorest writing I ever saw."

"Thank you, madam," said I, assuming a haughty tone, "I have the honor of wishing you good night."

I could see the surprised look on her face, at the altered tones, but I hurried away before she could speak.

A week later Miss Blanche came into the office to send a telegram. She occupied five minutes in writing it, during which time I was stealing sly glances at her fair face, and noting her attire which was, like her figure, faultless. She handed me the message, and as I read it was surprised to see that it was addressed to my sister at her home in Clinton, Mass. It read as follows:

"When may I look for you? Please telegraph reply. BLANCHE DE FOREST."

"Pardon me, madam," I exclaimed joyously; "are you acquainted with my sister, Hattie Holbrook?"

"Why, yes;" she answered surprised. Hattie and I are fast friends. We were roommates at Vassar College last term, and she promised to come and visit me this summer. Is it possible that I am speaking to her brother of whom I have heard so much? Are you Mr. Harvey Holbrook?"

I assured her there was no mistake.

"Why," she said, "Hattie never told me you were a telegrapher. She and I had a set of instruments in our room at Vassar and we were becoming quite expert when the term closed."

"Hattie does not know that I am an operator," I replied, "and in fact I can scarcely lay claim to that title as yet. My fellow-operators see fit to call me a 'ham.' I wrote home that I was engaged in business here but did not mention what it was. It is only a freak of mine. Like yourself I learned it at college, and hearing of a small office here decided to try it during vacation, but my many mistakes and poor penmanship (here I looked hard at her) convinces me that telegraphy is not my forte."

"Pardon me," she said, suppressing a smile; but isn't your messenger rather an amusing boy—does he not indulge in mimicry sometimes?"

"I have never known him to do so," I replied; "why do you ask?"

"Oh! it is of no consequence; but one evening last week he came to the house with a message. He only spoke twice; the first time in the tone of a Yankee, and the second time it was full of dignity and hauteur. I could not understand it."

"Very strange," said I. "Can you describe him?"

"I did not get even a glimpse of him," she said, laughing. "He paid no attention to my invitation to step in."

"Well," said I, "I can assure you that should that particular messenger be so fortunate as to receive another such invitation, he would avail himself of it with alacrity."

She gave me a knowing look and, smiling archly, said, "he may consider himself a welcome guest at any time."

The rest is soon told. My sister Hattie made Blanche her promised visit a month later, and was much pleased to learn that her friend would soon become her sister-in-law, which happy event took place the following Christmas.

THE TROUBLES OF THE COMMERCIAL TELEGRAM COMPANY.

The sheriff has levied on the property of the Commercial Telegram Company to satisfy two judgments, one for $287,312.26, in favor of John W. Mackay, and one for $32,120.61, in favor of Edward C. Platt. They had been granted in the Superior Court through default. The Company gave notes for these amounts, defaulted payment and made no answer in the suits to recover.

The trouble that culminated in the execution originated shortly after the Commercial Telegram Company began business, three years ago. Stephen D. Field, a nephew of Cyrus W. Field, invented a "ticker" for telegraphing from the Stock Exchange and printing in sub scribers' offices quotations like those furnished by the Gold and Stock Telegraph Company. This ticker service was fought bitterly by the Gold and Stock, which is owned by the Western Union people. A war of rate cutting began, and it came near breaking the Commercial Telegram Company. They borrowed various sums at intervals from John W. Mackay, of the Commercial Cable Company, one of the Western Union's strongest rivals. Later on Edward C. Platt furnished funds. When the officers of the company found that they couldn't get any more, they bunched the sums of their indebtedness into demand notes to Messrs. Mackay and Platt and defaulted payment.

The company's plant and real estate were sold to Mr. J. W. Mackay for $155,000, on December 23, to satisfy the judgment.

The Commercial Cable Co. has a new route to Canso, N. S., *via* the Canadian Pacific through Canada, but it is to be used only in cases of emergency.

Kansas City Councils will fix telephone rates

CABLE-LAYING SECRETS.—The New York *World*, of Dec. 12th, pays its compliments to the Siemens Bros. thus: "When the steamship Faraday was about starting out from Nova Scotia to lay the two new Western Union cables into the harbor of New York, application was made by Dr. Green, the President of the Western Union Company, for permission to place on board a newspaper man who proposed to furnish the New York *World* an account of the laying of the cable. The answer came back that permission of this kind could not be accorded for the reason that the Siemenses, who were laying the cables, preferred not to have their mode of procedure observed and reported Men who know something about cable-laying laugh at the position taken by the cable-layers and point out that following this absurd policy of secrecy the same firm has terminated the cables they have laid at the most outlandish places that they could possibly select. It is contended that there is no secret process in the laying of cables at all, and that they can be laid well enough by any intelligent shipmaster and will probably be laid long after the present cable-layers have gone out of existence. Notwithstanding this the cable-layers have selected the wildest spots along the coasts of Newfoundland and Nova Scotia to terminate their lines, and in the case of the Commercial Cable Company landed the shore ends at a point which was scarcely habitable at all. The employees of this cable company have had to build up a village of their own, have had to send to civilization for their wives, and under these circumstances the company ha s of course found it rather difficult to mainta n its force in a contented frame of mind."

SENDING MORSE BY TYPEWRITER.—The experimental telegraph transmitter exhibited by O. D. La Dow to the railway telegraph superintendents on the occasion of their annual convention in October, has been perfected and the details of construction made public. In some respects it is similar to an ordinary typewriter, having a bank of keys, each one of which represents a letter or other symbol. A single stroke of a key transmits a perfect Morse letter. Each key-lever carries a pivoted sector, which, upon depression of the lever, is pressed upon a revolving felt-covered roller, by which the sector is moved forward through a short space until the letter is completed, and it then drops back to its place. The sector is made of metal, with insulating blocks set in its edge in such a manner that the conducting portions, in passing over a light contact-spring, make the desired combination of dots and dashes. It is expected that the principal use of this transmitter will be by expert Morse operators rather than by novices. It is claimed that it will greatly lessen the labor of sending by the Morse code, while every letter will be made in proper proportion and with mechanical exactness. Mr. La Dow estimates that 45 words per minute can be transmitted with the greatest ease. The system will be specially adapted to press matter.

The annual reception of the Friendship Boat Club will be held at the Central Opera House, 67th street, near Third avenue, on the evening of Wednesday, January 15th, 1890. The membership of this club includes a number of telegraph people, and if the promoters of this entertainment pull together as well as they do in their boats their efforts will be successful.

After six years' service with the C. M. and St. Paul road, W. P. Morgan, of Darlington, Wis., has resigned and accepted an offer from the M. and N. at Ontonagon, Mich.

Lieutenant J. A Swift, of the Signal Corps, Ashland, Oregon, has been transferred to Norfolk, Va., as officer in charge of the station at that point.

CHICAGO NOTES.—It is not exactly last New Year's Edition, but it is a dandy all the same, was heard on every hand when the last issue made its appearance among us. The AGE should be in the hands of every operator in the country. Its enterprise truly deserves it. The enlargement of the AGE made a very favorable impression. Business in this office is gradually dropping off into its regular winter channel. A few changes are here recorded: Mr. Chas. Crowell, loop chief, has gone to Portland, Ore., to be chief operator. Mr. B. M. Gossellin, who formerly had charge of the B. & O. switch board, is filling Mr. Crowell's place. Mr. Powell, one of our oldest operators has been put in charge of the Milwaukee wires switch board. Mr. Nelson has been called home on account of the illness of one of his children. Miss Thompson is relieving Miss Hayes, manager at Ottawa, Ill., for a week. Chief Childs has returned after two week's illness. Messrs. Danforth and Appleby have gone to St. Louis. At the election of officers held on Dec. 21st, by the Morse Council, 347, National Union, the following officers were elected for 1890: President, John H. Curtis; Vice-President, E. L. Boole; Ex-President, P. W. Drew; Secretary, F. J. Scherrer; Financial Secretary, Henry Behl; Treasurer, Edward D. Bangs; Speaker, F. M. Crittenton; Chaplain, L. A. Crittenton; Usher, Chas. S. Loewenthal; Sergt-at-Arms, T. R. Quinlan; Door Keeper, E. M. Stannard. Trustees, H. H. Smith, S. T. George and J. S. Henderson. Delegates to Cook County Cabinet, J. H. Curtis, F. M. Crittenton and P. W. Drew. Representative to State Assembly which meets in Chicago in May, P. W. Drew. Alternate, J. S. Henderson. The Chicago Telegraphers Aid Society is in a very flourishing condition. During the ten months of its existence it has paid out $175 benefits and has $385.95 in bank. The next meeting of this society will be held on Feb. 4th, 1890, when suggestions will be heard as to changing the by-laws.

At the Benefit, which takes place at the New Lyceum Opera House, 34th street and 3rd ave., on January 4th in aid of the family of the late Patrick Sullivan, who was killed at the Electric Light Works, 80th street, East River, Miss Florence Miller and Mr. Thos. Ballantyne will appear in the farce "A Happy Pair." The entertainment is under Mr. M. J. Dixon's management.

Mr. Robert Stewart, superintendent of telegraph, Central Railroad of New Jersey, has the sincere sympathy of his numerous friends in the sad death of his wife, who, as a result of prolonged suffering from ill health, jumped from a ferry boat while off the Battery, on December 28, and was drowned.

The appearance of such of the down-town streets as are being torn up by workmen engaged in laying the subways resemble, at night, with their myriads of red, with here and there a few white lights, a railroad freight yard, passage through which is almost as dangerous.

NEW YORK WESTERN UNION NOTES.—With his usual foresight Manager Dealy has issued an order absolutely prohibiting the circulation of a petition or petitions for the purpose of remembering any chief operator in the office with a present. It is gratifying to know that the obnoxious practice of calling upon operators to contribute toward the purchase of something for their more fortunate fellows is rapidly going out of practice. Owing to the serious injury sustained by Mr. Cornish in alighting from a Brooklyn ferry boat, a few nights ago, Mr. J. F. McGuire succeeds him on the Albany quad. The many friends of Mr. Thomas Tracy will rejoice with us to learn that in the assault without provocation upon his person by a drunken man, the other evening, in front of a well-known hotel in Chicago, he sustained injuries of a nature no more serious than a black eye and a slightly bruised cheek. The report as at first received was to the effect that he had been fatally stabbed. Mr. Dillon has gone to Jacksonville, Fla., for the winter, in company with Mr. Simmons. Mr. Simmons is an artist in more ways than one, as the desk diaries plainly bear evidence. A number of operators are on sick leave, owing to the draughts throughout the room. Efforts to remedy this trouble have thus far been unavailing. Mr. Dealy has recently authorized the porters to see that in no case the temperature of the department shall exceed 80° Fahrenheit, and to remind them of this fact, thermometers have been permanently located in various parts of the room. Mr. George H. Goodfellow has been transferred from the 8 to 5.30 force to the 7.30 to 4.30 force. Mr. E. W. Morrison, for several months past stationed at the Chicago *Times* Bureau, has returned to 195. He is succeeded by Mr. Martin Erwin. The last issue of the AGE met with general favor and its appearance in its improved form received many words of commendation. The introduction of storm windows is a move in the right direction. However, had they been more timely, colds would have been scarcer. Some of the handsomest specimens of lace work, embroidery, etc., etc., we ever saw on exhibition anywhere, in this or any other city, were turned out by the ladies here, presumably as holiday gifts for their admirers among the sterner sex.

PRESENTATIONS.

MR. MACKAY'S HANDSOME PRESENTS.

There were bright and happy faces in the offices of the Commercial Cable Company on the afternoon of the 24th December, and not in New York only, but on both sides of the Atlantic. For John W. Mackay, the president of the company, had put a girdle of gladness about the earth in something less than forty minutes.

Mr. Mackay had simply done what he has done every year since the Commercial cables were opened, but what never fails to fill the employees of the company with grateful hearts. He had sent an order to General Manager Ward instructing him that every employee of the Cable Company, from the lowest to the highest, should have a Christmas present of a half month's pay. Over three hundred men and boys were made participants in this handsome gift, which, it is said, costs Mr. Mackay about $15,000. The money does not come from the company, but from Mr. Mackay's private funds.

On X'mas Eve, Mr. George Clapperton, the New York Superintendent of the Commercial Cable Company, was the recipient of a beautiful alligator traveling case with solid silver fittings, from the members of his staff. His initials were engraved on each article. It was a complete surprise to Mr. Clapperton, and in a letter of acceptance he feelingly acknowledged this kind expression of good will.

Mr. Frank H. Dennis, chief of the Clearing House Department of the same company, was also presented by the clerks in his division with a Christmas gift in the shape of a handsome meerschaum cigar holder accompanied by an appropriate letter.

It is a great pleasure to us to hear of presentations of this kind, as they can only tend to make the working together of a body of men pleasant and harmonious. We think the employees of the Commercial Cable Company are a happy and contented staff, and we congratulate them as well as the company—what is good for the employee is certainly good for the employer.

Mr. S. F. Austin, New York Superintendent of the French Cable Company, found on his desk on X'mas Eve, just before leaving his office, a fine, massive, onyx parlor mantel clock, which his staff asked him to accept with cordial Christmas greetings, and as a slight mark of the esteem in which they held him. We believe this is not the first time Mr. Austin has been remembered by those under him. We congratulate him and his company.

$10.00 AND $5.00 FOR ORIGINAL STORIES FROM LADY SUBSCRIBERS.

The ELECTRIC AGE will give $10.00 to the lady telegrapher who composes and sends us for publication the best original telegraph story. A second prize of $5.00 will also be given to the lady telegrapher sending the second-best story.

The conditions are: 1st. The lady must be a subscriber to the paper; 2d. The story must not exceed 500 words in length, and *one* side of the paper only should be written on.

A *nom de plume* may be used if preferred.

Two stories from the same author will not be admitted in the same contest. The prizes will be awarded when not less than ten stories have been printed, and at least two of the stories will appear in each issue until that number has been reached.

Mr. George E Holbrook, President of the New York Telegraph Club, has kindly consented to act as referee. Mr. Holbrook possesses well-known literary ability, and any decision he might render is certain to give general satisfaction. Now, let the ladies contribute.

HEADQUARTERS FIRE DEPARTMENT.

BROOKLYN, N. Y., Dec. 4, 1889.

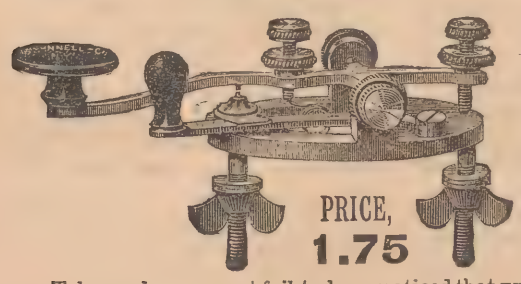
The Electric Gas Lighting Co., 35 Arch street, Boston.

GENTLEMEN :—Yours asking my experience with "Samson" Battery received, and in reply I would state that in twenty years' experience and use of batteries I have never found one that could equal it for open circuit work. I have replaced all local and open circuit (carbon) batteries (some five hundred) with the "Samson," cell for cell. It has been in use in each instance over seven months, and is as good as on first day. One circuit, attached to vibrating buzzer, was left closed twenty-seven days, constantly working the buzzer without running the battery down.

Very respectfully,

(Signed) **P. L. WATSON, Superintendent.**

J. H. BUNNELL & CO'S
STEEL LEVER SOLID TRUNNION KEYS.



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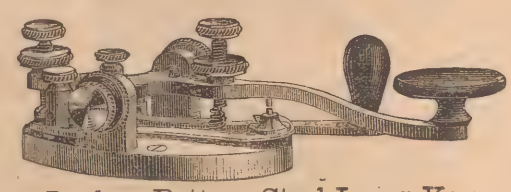

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A Beautiful and Perfect Key suitable for use on fine desks, or wherever a Legless Key is preferable. PRICE, carefully boxed, and sent, prepaid by mail, to any part of the United States, $2.25.

This form is especially convenient for operators who wish to possess their own private key, as it can be readily placed anywhere or removed without boring holes.

Telegraphers cannot fail to have noticed that upon the introduction of the BUNNELL STEEL LEVER KEY over eight years since, it at once achieved a vast popularity, such as never before attached to any specialty in Telegraph Instruments, and that this popularity has continually increased, and is still increasing.

It will also be noticed by Telegraphers, that since the STEEL LEVER KEY was introduced, a brood of "improved" keys has been hatched and put forward from various sources from time to time each one made to look as much like the STEEL LEVER KEY as possible, or made with some kind of a "steel lever," or "patent lever," and in every case *claiming* all the merits possible and impossible that language could describe. Most of these "improved keys" have become exterminated by the force of their own worthlessness. Years of practical test in the use of THOUSANDS of BUNNELL STEEL LEVER KEYS throughout America demonstrates their perfection and popularity. BE NOT DECEIVED BY THE ABSURD IMITATIONS.

THE BUNNELL STEEL LEVER KEY is *more durable*, and in every respect *better* than any other for rapid and perfect sending for the following reasons :

The Lever is *only one-half the weight* of the ordinary brass lever as generally made.

The entire Lever and Trunnions together being made of *but one piece* of fine wrought steel, the common defect of loose trunnions is avoided, the strength of a heavy brass lever is obtained with much less weight of metal, and, by the perfect bearing which the solid trunnion gives, together with the use of *hardened platina points, sticking is absolutely prevented.*

The size and proportions are such as to make it the most perfect operating key possible to obtain, either for the hand of the skilled and rapid expert, or the beginner. **Price, $1.75. Finely Finished, and Lever Nickel Plated.**

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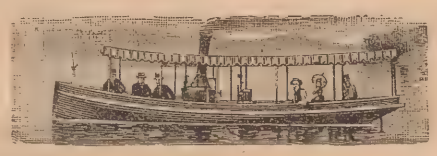

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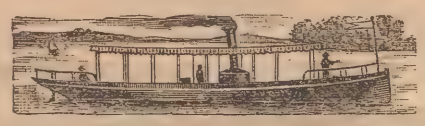

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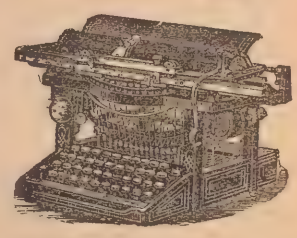

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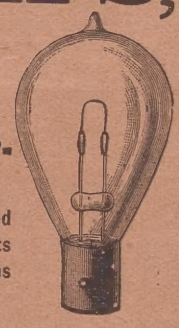

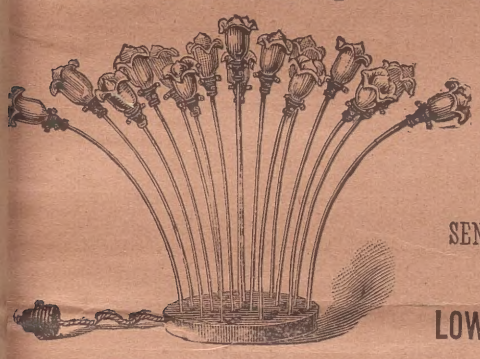

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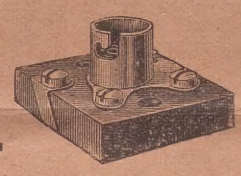

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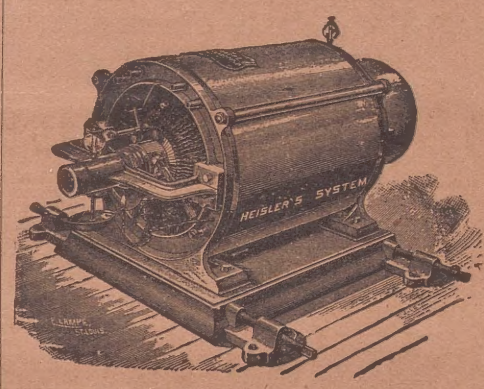

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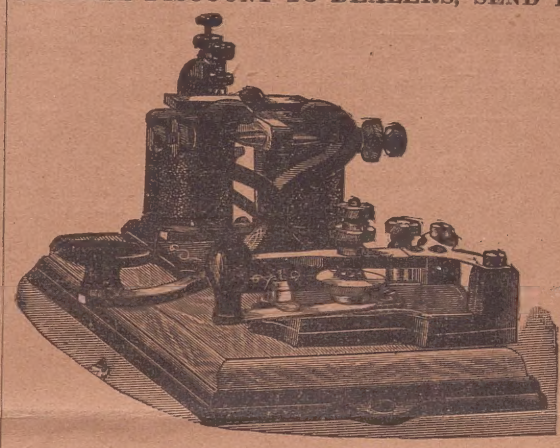

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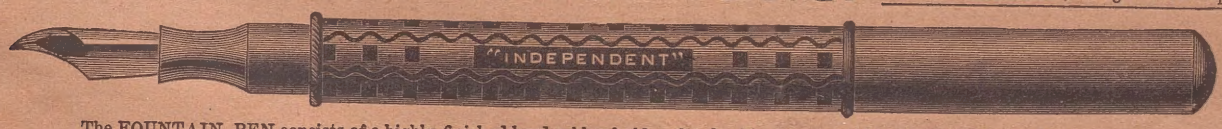

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