

THE ELECTRIC AGE

TELEGRAPH EDITION.

VOL. VII—No. 16.

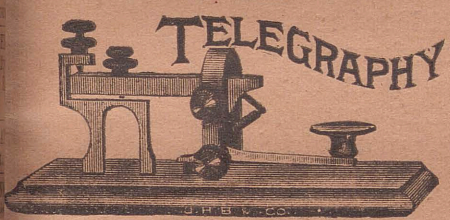
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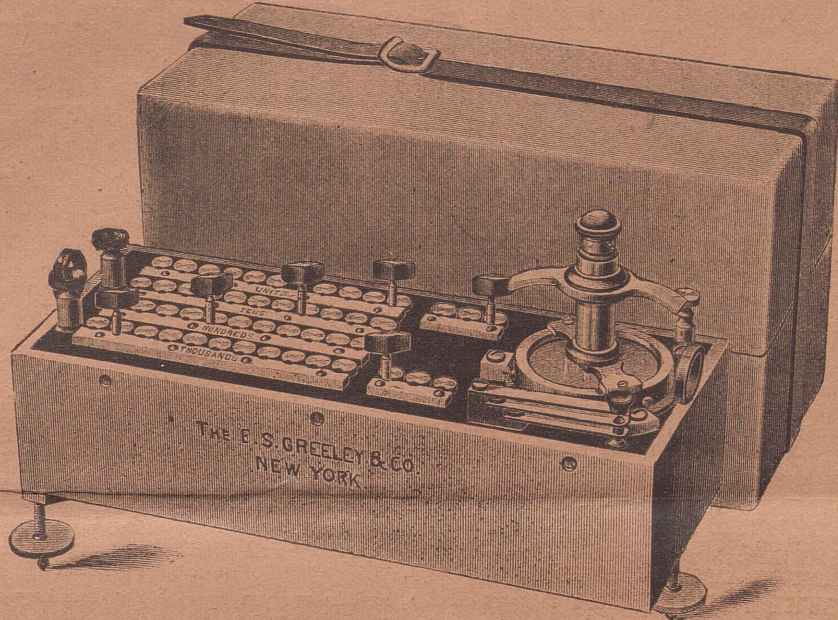
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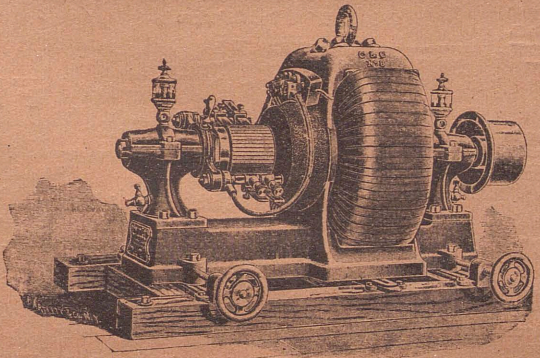
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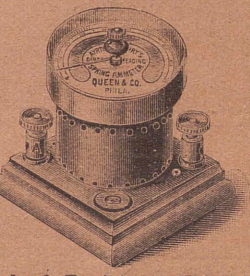


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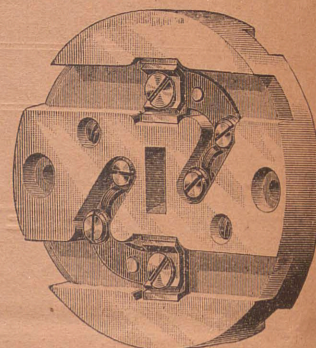
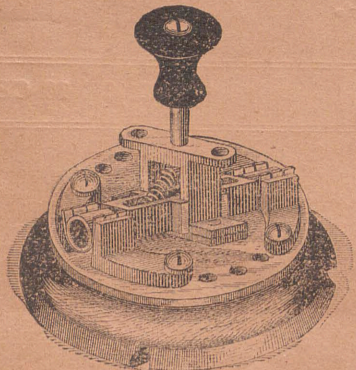
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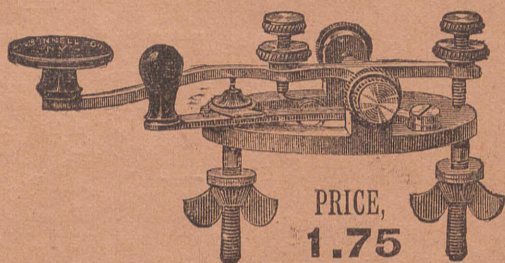
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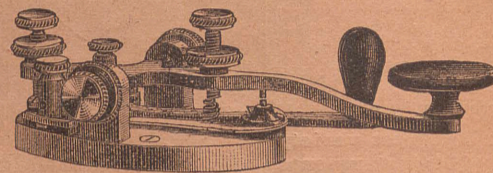


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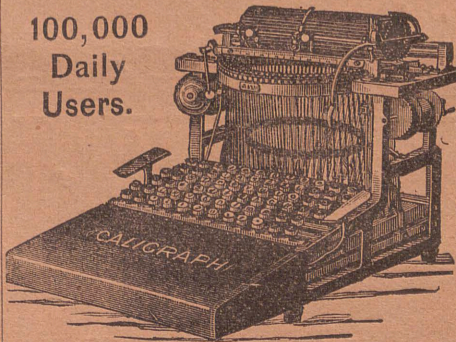
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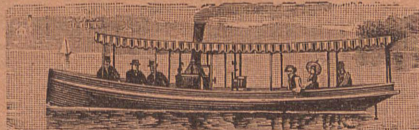


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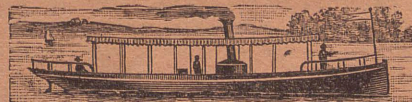


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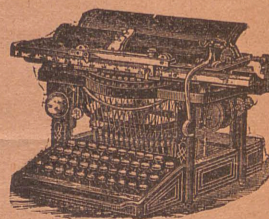
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J. B. TALTAVALL, President.

G. E. HOLBROOK, Secretary.

T. R. TALTAVALL, Treasurer.

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The order of Manager Dealy absolutely prohibiting the circulation of subscription papers in the office, to present some chief with a "token of esteem," etc, is worth more than a passing notice. The same action should be taken in every telegraph office in the country. We frequently hear of some operator who cannot afford to contribute financially toward the purchase of a gold-headed cane to present to some one who has not the slightest use for such an article, but who is compelled to do so for fear appearing ungenerous to associates or, what is worse yet, the fear of being boycotted.

The recipients of these "tokens of esteem," often feel that they would rather not have been so distinguished. They naturally think that they are placed under obligations, but cannot reciprocate in any substantial manner. Many such articles as gold-headed canes have been presented to chiefs and managers, and then laid away in a closet to rot. They are very seldom used, and when they are, it is only in defer-

ence to the donors and not on account of the utility of the article.

The prohibition, no doubt, will be hailed with satisfaction by all interested—the contributors will not be compelled to act against any scruples of conscience, and the recipients will be spared much embarrassment. It is pleasant to be remembered by friends, and a spontaneous testimonial of esteem is something commendable, but to make presentations by the wholesale, and on the least provocation, spoils the tender sentiment which ought to be an accompaniment of events of this class.

Manager Dealy is wise in suppressing the evil, for such it is getting to be.

CABLE EARNINGS.—The gross earnings of the Commercial Cable Company for the quarter ending December 31, partly estimated, were \$495,189, and net \$320,187. The statement for the year shows gross earnings of \$1,789,387, and net \$1,089,379. Interest charges for the year were \$140,256, being six per cent. upon \$2,337,600 of debenture bonds, and sinking fund requirements were \$200,000, a total of \$340,256, leaving \$749,123, or more than eleven per cent. applicable to the stock. An Atlantic cable company which can show earnings equal to eleven per cent. with the present sharp competition, must be pretty well managed.

THE GOLD AND STOCK LIFE INSURANCE ASSOCIATION.

The twelfth annual meeting of the Gold and Stock Life Insurance Association was held in New York on January 13th, and was well attended.

President Hutchinson's report was read. It congratulates the members on the continued prosperity of the Association, and the gratifying increase in membership during the past year. The reserve fund has more than doubled, while the death rate still remains safely below the average accepted as authoritative.

The secretary's report shows present membership 637, a gain for the year of 132.

During the year the Association has extended its lines to Rhode Island, Maine, Kentucky, Georgia, Minnesota, Indiana, Arizona, Utah and California, making in all 21 States and Territories, in which it is now known.

The Auditing Committee's report shows: Balance on hand January 1st, 1889, \$2,039.00; Receipts during the year, \$3,697.46. Total, \$5,736.46.

Disbursements \$930.87; leaving balance on hand December 31, 1889, \$4,805.59; gain for the year, \$2,766.59.

After the re-election of the present officers the meeting adjourned. The following is a list of the officers: President, R. J. Hutchinson; Vice-president, A. J. Driver; Secretary, Wm. J. Dealy; Treasurer, M. Breslin. Executive Committee: R. J. Hutchinson, J. W. McLaren, J. J. Barry, E. F. Cummings, M. Breslin, T. J. Sullivan, W. H. Collins, A. J. Driver, Wm. J. Dealy. Auditing Committee: F. W. Baldwin, J. M. Moffat, W. H. Jackson.

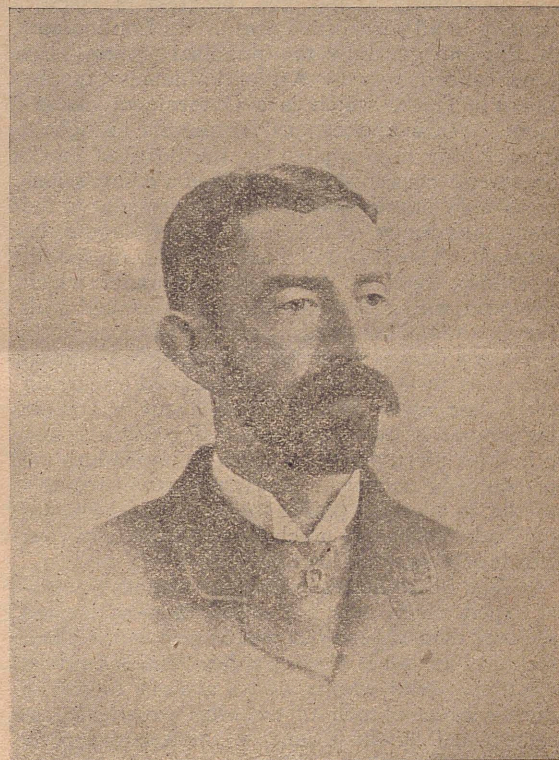
The influenza has had a firm grip on a large portion of the telegraphic fraternity. In many of the large offices the operating forces were considerably reduced. Heretofore it has been regarded as a misfortune for an operator to lose his "grip," but now it is otherwise. We hear of many wishing they could lose theirs.

Amos A. Lincoln, a telegraph lineman of Philadelphia, who is at the New York Hospital suffering from a nervous disease, contributed nearly two pounds of his blood to save the life of a girl who had been asphyxiated. The transfusion was successfully performed, and the girl will probably recover, although she had been unconscious for several days previous to the operation.

BIOGRAPHICAL SKETCHES.

SAMUEL S. DICKENSON, SUPERINTENDENT COMMERCIAL CABLE CO., CANSO, N. S.

Samuel S. Dickenson was born at Plymouth, England, on the 8th of May, 1852. He received his education at the high school of that city, and entered the telegraph service in November, 1867. He remained at Plymouth three years, and on the government assuming the control of the telegraphs in 1870 he was transferred to the central office in London. He was at this time acknowledged to be one of the best operators in the country. In 1874 he joined the Direct U. S. Cable Company's service, and was sent out to Torbay, Nova Scotia, in charge of a portion of the staff of that station. He became assistant superintendent there, and did much to make the Direct Cable a success. In March, 1884, he accepted the position of Hazelhill, N. S., (Canso), for the Commercial Cable Company, where he has five cables under his charge. His work at Canso is too well known to require any mention here. No telegraph man is better known or more esteemed throughout the province of Nova Scotia than S. S. Dickenson. He is a gentleman of great ability



S. S. DICKINSON, SUPT. OF THE COMMERCIAL CABLE CO., CANSO, N. S.

and much tact, an expert electrician, and has few equals as an all round telegrapher. As a manager, Mr. Dickenson has no superior, thoroughly straightforward in all his dealings, he possesses a most kindly disposition, and no man could possibly be more popular with his staff. Mr. Dickenson is of commanding appearance, standing six feet three inches in height, is married, and has three fine boys. His wife is a most estimable lady, and a favorite with all who have the privilege of her acquaintance. Mr. and Mrs. Dickenson are at present on a visit to this city, and we extend to them a hearty welcome.

A STANDARD WIRING TABLE.—At the December meeting of the Council of the American Institute of Electrical Engineers, a committee of members was appointed to formulate and submit for approval a standard wiring table for lighting and power purposes. The committee consists of F. B. Crocker, chairman, Thomas P. Conant, Dr. Louis Duncan, Prof. W. E. Geyer, A. E. Kennelly, Geo. B. Prescott, Jr., Prof. E. P. Roberts, William Stanley, Jr., Dr. Schuyler S. Wheeler.

PROF. GEORGE FORBES, F. R. S. OF LONDON, ENGLAND.

Prof. George Forbes, F. R. S., of London, a member of the Royal Society of Electrical Engineers, is staying at the Windsor Hotel, in this city. He has inspected all the principal electric lighting stations in Europe and has made the subject of electric lighting a study for years.

In reference to the agitation over electric lighting in this city, Prof. Forbes expressed himself as follows:

"What has most impressed me in my various visits to this country, especially in New York, is the very temporary manner in which circuits have been constructed and the great risks run by the corporations who started the lighting for the sake of a temporary profit; whereas in Europe those who have initiated electric lighting from central stations, especially with high pressure, have foreseen the absolute necessity of adopting every precaution against fire and life risks in the interests of electric lighting generally. This period of bad work in New York has seemed to me and other electricians abroad to be followed by a period of incompetent supervision by the Board of Electrical Control, and finally to be followed by panicky legislation on the part of civic authorities, which is telling disastrously against the progress of electric lighting in all parts of the world. In London and in England generally the principal control has been handed over by Act of Parliament to the Board of Trade, which is a Government department. When applications for powers to light a district have been applied for, the Board of Trade on several occasions has appointed a commissioner to hold inquiry and to hear evidence as to the conditions under which such power should be granted. The Board of Trade has also on special questions, such as the conditions under which overhead wiring shall be allowed, consulted with the Council of the Institution of Electrical Engineers and thus obtained the best possible technical advice as to rules and regulations. Further, in every case where the Board of Trade has made regulations it has also regulated penalties, and otherwise given power by which its regulations are certain to be enforced. As far as I have been able to see, in all these points the action of the Board of Trade differs very much from the action of your Board of Electrical Control.

"The Board of Trade has a permanent electrical expert whose duty it is to give them advice and see that their regulations are carried out. Their technical adviser is Major Cardew, who is a skilled electrician, and who is always anxious to call in the assistance of men of technical experience, as represented by the Council of the Institution of Electrical Engineers. Electric-light currents have been distributed in London by means of overhead wires in the past, but in the future everything will be put underground. I may say that our overhead work has always been done by the electric-light companies with great judgment and foresight, and with a view to their permanent rather than their temporary interest. The overhead work has been done in an admirable manner, with the best insulation and with perfect mechanical construction; and even with a pressure of 2,500 volts alternating current no damage to the wires has occurred and no deaths from the high-tension currents. Both the public and the electric-light companies feel that for permanent work the conductors must go underground: this substitution is going on gradually, and before many years have elapsed will be completed. All the permanent new work is now being put underground.

"We have been operating high-tension currents in London for some years without any deaths, and this is simply due to the fact that proper care was taken in the construction of the lines. I believe that the application of similar methods in New York city would result in the same degree of safety.

"I know of cases where underground distribution has been in use in Europe for about six years with perfect success. The Grosvenor-Gallery station which uses the alternating currents of 2,500 volts, has had many miles of conduit at

work for several years. In Milan, also, similar currents have been used underground for several years, and in many other places which might be mentioned. For that matter in most continental towns the electric light wires are placed underground.

"It is not only demonstrated by theory, but by practice as well, that currents can be operated successfully and safely underground. The best evidence of this is perhaps to be got from the action of the London companies. Take, for example, the London Electric Supply Company, which has invested something like £250,000 in overhead conductors and which is now going to the expense of putting the whole of these underground; and the Metropolitan Electric Supply Company, which is using a large portion of its capital of £500,000 in putting its mains totally underground.

"European electricians do not agree with the statement made by the great American electrician, Thomas A. Edison, that putting the high-tension wires of this city underground would increase the danger. If he made such a statement I think it must have been a hasty and hardly sufficiently considered statement, because in his conversation recently with electricians in Europe I think he must have realized the general impression that the danger from electric shocks is thus almost entirely prevented.

"The subways in this city, I have observed, are constructed either of wrought or cast iron pipe laid in cement, or cement-lined pipe laid in cement. I consider that this is one of the most convenient and satisfactory means of laying the conductors, provided always that the insulation of these conductors is of the best possible description. The drawing-in system, involving the use of wrought-iron pipe from two to six inches in diameter, has been extensively used in London, and alternating currents of 2,500 volts have been conducted through them with entire success. We have had no experience with cement-lined pipes in England, but we would certainly prefer them to the ordinary iron pipe.

"I may say that the present tendency in incandescent lighting in England is almost entirely in favor of the alternating current system. I think that nine-tenths of the capital which is now being expended in electric lighting in London is for central stations on the alternating current system. There are districts, however, where the continuous current at low pressure can be worked economically; such as the St. James district, which includes all the clubs—highly concentrated districts where the lights are applied up to late hours of the night. This is one of the special cases where that system can be used economically.

"I consider both systems absolutely safe as regards electric shocks if the insulation is properly attended to, and if the total system is under proper supervision and regulations. The risk of fire would also be trifling if these conditions could always be fulfilled. As a matter of fact, however, fire risks are greater where large quantities of electricity are introduced into houses than when a high pressure is adopted; and I also consider that the separation of the mains in the streets from the wiring in the houses by means of the alternating-current converter is a great security, when proper steps are taken to insulate the high-pressure current of the streets from the houses."

CAN ELECTRIC CURRENTS BE MADE SAFE?

WHAT PROMINENT ELECTRICIANS HAVE TO SAY ON THE SUBJECT.

The following replies in answer to our circular on the above named subject have been received since the discussion in our last and previous issues:

THOMAS D. LOCKWOOD,
ELECTRICAL EXPERT, AMERICAN BELL TELEPHONE CO., BOSTON, MASS.

Question 1.—Can over-head electric light lines be rendered reliably safe at all times? If so, how?
Answer.—I think they can generally, yet no

matter how carefully they are constructed and maintained contingencies will rise which cannot be foreseen, just as in the operation of railways or any other business.

Question 2.—In your opinion, is there any reliable and durable method of insulation which can be applied to over-head electric light wires, and which will absolutely prevent any escape of current, particularly in wet weather?

Answer.—Yes several, if pains are taken, to look out for wear and tear; by daily and even more frequent testing, and by prompt removal of defective wire.

Question 3.—Is there, in your opinion, any reliable method of laying electric light wires underground? If yes, please state.

Answer.—Not by any but the common sense method. Knowing what is to be done it can be done. I am quite certain that a proper conduit can be made for electric light wires alone which can be made quite safe.

Question 4.—In your opinion, would the existing dangers be entirely overcome by placing the wires underground?

Answer.—No. Danger will always exist where any of the forces of nature are employed. It can however, be much minimized by proper care.

Question 5.—How, in your opinion, can the danger to life and property, so frequently exemplified of late, be completely overcome?

Answer.—It cannot at all; but it can be cut down very materially by the best work, the best men and the best materials. By good construction, constant watchfulness, and careful maintenance.

Question 6.—What means should be adopted to prevent fire in case of derangement on electric light circuits running into buildings?

Answer.—A cut-out inside operated from the outside. Wires run on non-combustible bases, and fuses at all necessary points with a receptacle to catch molten metal.

The subject is one which cannot properly be discussed by a few answers to questions. In the first place I think and have always thought it wrong to place so many arc lamps on a circuit as to require the driving of a current of from 8 to 16 amperes at a pressure of from 2000 to 3000 volts.

But since this is done, the proper thing to be done is obviously to use proper insulation. This everyone knows that but few electric light companies have done. They have used the non-insulating covering known as underwriters; well knowing it to be no insulator at all; and while good articles could be purchased if customers were willing to pay the price.

The substance of the whole matter is that electric lighting will always be liable to cause accident, exactly as is gas, steam, fire or any other force which man has made subservient; but that this liability can be reduced to a very low point, if the business is properly run, few lamps on a circuit, proper insulation used; and if care, the care necessary in dealing with a possible dangerous force, be taken by management and men to make construction good, keep repairs well up; to take down immediately all bad work; and to be personally careful in handling all parts of a circuit.

The force of an electric light company ought to have as strict discipline as an army—and notices ought always to be put up warning the public to let things alone.

And if judgment, and the proper amount of money be laid out, this safety can be secured just as well underground as overhead.

It is too costly? it won't pay? Then the business should be discontinued. No man has a right when engaged in a business which under certain conditions is hazardous to himself and others, to neglect the conditions of safety because they are costly.

Mr. Chas. Cuttriss, electrician of the Commercial Cable Company, was presented by his colleagues with a very pretty silver match box for X'mas.

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

ELECTRICAL EXPERT KINTNER DISCUSSES THE ELECTRIC LIGHT QUESTION.

NEW YORK, January 8th, 1890.

To the Editor of "THE ELECTRIC AGE."

Sir:—Touching the question of proper insulation and the construction of systems of electrical conductors for electric lighting, I think very much valuable information might be obtained from our slow-going English cousins, who, if they have not made rapid strides in the introduction of electric lighting plants, have, at least, been very certain of their ground, in so far as they have substituted this modern innovation for older and alleged safer systems of illumination.

During all of the discussion which has taken place within the past year in America, very little seems to have been said by electricians of the progress in this direction abroad. In the great city of London I am advised that accidents from electricity are very, very rare, and that the statutes governing the distribution of electrical currents are based upon practical common sense ideas, while those who have to do with the construction and the management of electrical systems are, in every instance, as they should be, expert electricians who put into practice engineering ideas only in this very important art. The greatest care is observed in locating electric light conductors on poles entirely apart from similar means of support for telephone and telegraph wires. The insulation is of the most perfect nature, and every detail of construction, looking to the safety of the public, is most rigorously carried out. To what extent these important features are followed in this country, and particularly in New York City, it is obviously useless for me to say, and until the entire control of this important industry which is a specialty in itself, be placed in the hands of specialists who have knowledge enough to dictate proper laws, and power to have the same passed, and always rigorously executed at the hands of subordinates who are educated experts, we can hope for no safety in the use of electricity by systems of distribution.

The system of concentric conductors, to which I referred in my answer to your inquiries, has been in use in London, between Deptford and Charing Cross, for almost a year, and the arrangement is as follows:

First. A central copper split tube constitutes one main conductor, which carries the entire primary current over a distance of eight miles. This copper conductor is surrounded by what is known as the "Ferranti Compound," an insulating material which is found to answer the purpose, and tested at a million volts; outside of the compound is placed a metallic shield, acting in the nature of an armor, which in turn is connected to the earth through an outside surrounding iron tube, the latter being connected to one pole of one or more alternating current generators, the other pole of which is connected directly to the interior copper tube.

This enormous conductor carries at present, as I am advised, a primary current for 250,000 lamps, at an electro-motive force of 10,000 volts. At intermediate stations converters are used, converting, first, to 2,500 volts, and finally, secondary converters converting to 100 volts to the consumption circuits. These consumption circuits supply directly the 250,000 lamps, and have capacity for 1,000,000 lamps.

With the subordinate system of concentric tubing conductors of the same nature running into the houses, to the chandeliers and the lamps, there is no possibility of dangerous shocks, and with the proper system of cut-outs in the man holes adjacent to the main conductor, there is not the slightest possibility of high-tension currents entering the houses. The outer concentric conductor acts as a protector both against moisture and dangerous shocks, and there is not the slightest question but that, with such a system, absolute security can be maintained. There is no danger of crosses between telephone, telegraph, or other wires and high-tension conductors, said conductors being always of the potential of the earth, and

the inner or return conductors being absolutely inaccessible.

In response to the replies which some of your correspondents have made, to the effect that there is now no means of avoiding the danger of high-tension alternating currents, I have simply to say, that the best proof that it can be done lies in the fact that it is being done, and successfully.

The hearty endorsement as to the safety, economy and practicability of this system by such eminent authority as Sir William Thomson, (and it has his endorsement), ought to quiet forever the baneful effects of the opinion of alleged electricians who make a specialty of dog killing with a special kind of apparatus for the sole purpose of belittling that apparatus in the eyes of the public.

Mayor Grant deserves very great credit for the vigor he has displayed in attempting to undo much that has been wrongly done by a stubborn, ill-advised predecessor, who seemed not to know what to do, and rarely willing to accept suggestions of those who knew the real needs of the issue.

In the heat of all this discussion Mayor Grant would do well to take into his confidence some practical electrical engineer known to be retained by none of the companies, and thoroughly conversant with this type of engineering abroad, where much more care and attention has been given the matter than here.

In the great bustle of Americans to make money, I am sorry to say, in many matters where life and property are concerned, self-gain is often made precedent to security. In Europe there is much more stability in this respect and rigorous laws for the protection of life and property are made and vigorously executed.

The present system of conduits used in the subways, made of iron and filled with lead-covered cables, has been well proven to be practically worthless in London, it being a matter of common knowledge there that the galvanic action between the lead and iron will soon destroy the iron, and yet the electrical experts who have this matter in charge here seem never to have realized it.

It is also a fact demonstrable that gases generated by the galvanic action between the lead, iron, and other dissimilar metals used, are often deadly and explosive, and the gas companies are accredited with leaky mains, and the electric light companies with leaky circuits, whereas the total trouble is due, as before, to self-generated gases in badly engineered conduits.

There are other very important matters, not enumerated here, that time and experience have developed abroad, which should be discussed and settled by properly trained experts.

These few suggestions are thrown out in support of my proposed settlement of the difficult problem.

Let us hope the time is ripe for a discontinuance of this interminable suicidal jangle between the leading electric corporations as to which has the better system. There is room enough for all. Both of the great incandescent systems are practicable, and each has its especial advantages under especial conditions; there is no gainsaying that fact. Both are dangerous under conditions predicated by the enemy; both equally safe under conditions based upon careful and considerate construction; either will "kill dogs" in the hands of a paid Guy Fawkes, masquerading under cover of humanity to fellow man.

Is it not time, then, to bury the hatchet in the interest of a common cause, and to exert our total energies in elevating rather than belittling the greatest of modern arts?

Yours truly,

C. J. KINTNER, C.E.

Our English friends are looking forward to the time when the Bell patents shall expire. They are proposing to establish co-operative telephone companies when this event shall come to pass, and are figuring on the possibilities of large profits on a small capital.

The alarm-clock of the future will have an Edison phonograph arrangement that will exclaim "Get up!" in stentorian tones.

ELECTRICAL PATENTS ISSUED DECEMBER 31, 1889.

418,198 Method of making collars or axles by electricity; Hermann Lemp and Elihu Thomson, Lynn, Mass.

418,227 Electric exercising machine; Edward W. Robinson, Boston, Mass., assignor to the Electric Exercising Machine Co., Nashua, N. H.

418,248 Electro magnetic motor; Nikola Tesla, New York, N. Y., assignor to the Tesla Electric Co., same place

418,249 Lightning arrester; Elihu Thomson, Lynn, Mass.

418,258 Electric railway signal; Edgar C. Wiley, Independence, Va.

418,270 Combined gas and electric light fixture; David J. Braun, Chicago, Ill., assignor to the David J. Braun, Mfg. Co., same place.

418,284 Quadruplex telegraphy; Clarence L. Healy, Brooklyn, N. Y.

418,301 Armature for dynamos; James J. Wood, Brooklyn, N. Y.

418,302 Automatic regulator for dynamo electric machines; James J. Wood, Brooklyn, N. Y.

418,303 Current-regulator for dynamo electric machines; James J. Wood, Brooklyn, N. Y.

418,322 Electric signal system for letter boxes; Geo. L. B. Rounseville, Chicago, Ill.

418,369 Screw-clip for electric wires; Geo. E. Huff, Hartford, Conn.

418,373 Electric railway; Hosea W. Libbey, Boston, Mass.

418,402 Electric brake mechanism for cars; Wm. H. Darling, New York, N. Y., assignor of two-thirds to Leo Bock, Jr., and Gardner P. Harrington, both of same place.

418,426 Incandescent electric lamp socket; Frank Thone, Oskaloosa, Iowa.

418,443 Mechanical telegraph instrument; Jesse H. Bunnell, New York, N. Y.

418,444 Electric arc lamp; Jesse H. Bunnell, New York, N. Y.

418,472 Electric meter; Chas. A. Pratt, Toledo, Ohio.

418,473 Electric light carbon; Llewellyn Saunderson, Kingstown, County of Dublin, Ireland.

418,483 Secondary battery; Albert E. Woolf, New York, N. Y., assignor to Beuno Loewy, same place.

418,484 Perforating machine; Frank Anderson, Peekskill, N. Y.

418,510 Method of finding the positions of distant objects; Bradley A. Fiske, U. S. Navy.

418,551 Apparatus for the manufacture of gas by electricity; Martin C. Burt, Lake View, Ill.

418,559 Electric meter; Alphonse J. Frazer, Paris, France.

418,602 Governor for steam engines; Louis Bell and William H. P. Creighton, Lafayette, Ind.

418,612 Ocean motor; Isaac St. C. Goldman, Los Angeles, assignor of part to Henry Timken and R. B. Davy, San Diego, Cal.

418,636 Electric light fixture; Geo. C. Baillard, New York, N. Y., assignor to J. H. Bunnell & Co., same place.

418,652 Generation and distribution of electric currents; Francis J. Patten, New York, N. Y.

418,653 System of electrical distribution; Francis J. Patten, New York, N. Y.

418,654 Electric motor; Francis J. Patten, New York, N. Y.

418,655 Distribution of electric currents; Francis J. Patten, New York, N. Y.

418,659 Dynamo electric generator; William Stanley, Jr., Great Barrington, Mass.

418,664 Electro magnetic type setting machine; William Dreyer, Frankfort-on-the-Main, Prussia, Germany.

The Ball Company is about to establish an electric light plant in Montgomery, Ala.

THE ANNUAL MEETING OF THE MAGNETIC CLUB.

The third annual meeting of the Magnetic Club was held January 9th. The report of the secretary, Mr. Geo. F. Fagan, showed the club to be in flourishing condition. The membership, which has heretofore been limited to one hundred, has been increased to one hundred and fifty. The constitution was in other respects amended so that it cannot fail to give general satisfaction.

When the election of officers was reached on the programme, President Bruch called Vice-President E. F. Howell to the chair, and in an easy, graceful manner said:

GENTLEMEN.—“In connection with the subject of nomination of officers, permit me to say that I have for some time felt that the best interests of the club would be served by what is known as rotation in office, and while I shall always wish to do all that is in my power to further the interests of the club, and am willing at all times to aid in its undertakings, I feel that it is due to the club's interest to make a change, at least in the office of president.

I therefore beg to place in nomination for President of the Magnetic Club the name of Mr. W. J. Dealy and to bespeak for him, if he is elected, the same hearty support and co-operation that has been given to me, and for which I desire to express my appreciation and thanks.”

Rounds of applause followed Mr. Bruch's remarks.

Mr. Dealy was then unanimously elected as president, and it was some time before Mr. T. P. Scully could be recognized by the chairman to make the motion, “that a committee be appointed to conduct the president-elect to the chair.” Mr. C. P. Bruch and Mr. E. C. Cockey were appointed and conducted Mr. Dealy to the chair.

On taking the chair, the president-elect spoke as follows:

GENTLEMEN.—“I thank you for the honor of electing me your president. There is labor as well as responsibility attached to the office; there has been something said about this club having only one object, and the criticism passed that it should have wider scope; it would in my opinion be difficult to find a better or wider object than sociability; it is the foundation of our joys, it is by sociability that happiness is brought into every home. The Magnetic Club is doing a grand work, grander than appears on the surface, grander than appears at our dinner meetings, grander than can be expressed by any words of mine. I hope that you will always find me in whatever may tend to promote good will among men, and when I say that, I mean every time to include the women; but I am only one man and can do nothing without your support.”

At the conclusion of Mr. Dealy's remarks, Mr. E. C. Cockey, in his usual happy manner, addressed the newly elected president as follows:

MR. PRESIDENT.—“For myself, for my fellow members here present, and (if I may be allowed to speak for them in advance), for all who will be our fellow members in the future, I beg to offer our cordial support, in your endeavor to maintain the objects for which the Magnetic Club was organized.

I concur with you, in everything that you have said with regard to sociability. I like the companionship of these, my fellow members. I enjoy it, and their enjoyment, more than I do the dinners that we attend. It is the fact that we are brought together, free from all restraint, that has a charm for me that exceeds anything that can be expressed in words.

I therefore wish to tender to you, in behalf of all these, and for all others, as well as myself, our hearty co-operation with you, in your

efforts to make the Magnetic Club a great success.

The officers elected for the year 1890 are as follows: President, Wm. J. Dealy; vice presidents, E. F. Howell, W. L. Ives, L. S. Jones, W. H. Baker; secretary, Geo. F. Fagan; treasurer, John Brant; governing committee, E. F. Cummings, Conrad Meyer, T. A. Brooks, Alonzo Beatty, D. W. McAneeny, J. M. Moffatt, J. B. Taltavall, C. P. Bruch.

A vote of thanks was given to Mr. C. P. Bruch, the retiring president, in appreciation of his services since the club's organization, after which the meeting adjourned.

The January banquet will take place some time during the present month.

CHICAGO NOTES.—That there is some fine literary talent among the craft in this city is evidenced by the fact that Messrs. A. L. Davenport, C. S. Andress and J. H. Curtis have entered upon the sea of journalism by issuing a “telegraph” paper. The first edition, which appeared on January 1st, was very ably and neatly gotten up indeed. *The Telegrapher* treats exclusively of matters telegraphic in the interest of the boys, although no champion of any movement or organization, nor to the detriment of any contemporary. We extend to our young friend the heartiest wishes of success, and hope that when one year of age it may be classed among its “big brothers.” As a Christmas greeting from the Cleveland, Ohio, Western Union force, we received a group photograph of that fine body of operators, and it occupies a prominent place on the east wall. Thanks are hereby expressed. W. R. Patterson, of the 9.15 split trick has been selected to fill a vacancy on the day trick at the Exchange, occasioned by the retirement of Newt. M. Kent, who left us to become traveling salesman for the Schoninger piano company. “Pat” was assigned to the St. Paul wire. John Shunk has returned from Helena where he has been employed on the Western Union. His return is caused by the delicate health of his wife. Mr. Shunk has been added to the 9.15 split trick force at the board. Cassius Marion Chaplin passed a successful examination at the Rush Medical College lately, where he has studied medicine for some three years, and will in a short time turn out as a full-fledged doctor. His resignation in this office has already been accepted. Quite a number of vacations were taken during the holidays, among which we note: Murphy to his home in Toledo; Arthur Vanderhoof to St. Joe, Mo.; assistant night chief, J. Crawford, to his home, Detroit, Mich.; James Cowdrey to Jamestown, N. Y.; Gus Carpenter to Madison, Wis.; Lee Butterfield to Toledo, Ohio and St. Louis, Mo.; Roebuck to Spring Valley, Ills.; D. C. Lee, of “Ex” to Buffalo, N. Y.; Jack Savoy, to his former home at Sarnia, Ont., and Miss Katie Townsend, to Oconomowoc Wis., all of whom, with the exception of Mr. Roebuck, have returned to their respective positions. “La Grippe” has made its appearance among us. Several were afflicted and all with the exception of Messrs. Otho Godman and O. E. Eaton have returned to their wires, “As” Sherwood, was likewise on the sick list, as was Tom Gibson, both of whom have again returned to their tables.

The other evening one of the Wheatstone men was assigned to an “Rq” wire to correct messages that had wrong checks and other errors. While working on this wire the circuit got into trouble and he so reported the fact to Chief Fox who told him to tell “X,” Toledo, to “come in” and fix it. When X was raised, he told the Chicago man to tell “H,” meaning Cleveland, to try the wire. The operator immediately went to the chief operator and told him “tell H, Cheyenne, to try this wire to New York.” Our time-keeper, Mr. Gелlette, who has been confined to his bed for a week or more, has returned to his desk.

Miss Nellie O'Brien, of the C. N. D., recently underwent a successful but very painful and delicate operation on her eyes, and we are happy to say has resumed her duties. Miss White, Mr. Stevely's assistant, is among those enjoying an extended vacation.

FAST SENDING TOURNAMENT DURING THE WORLD'S FAIR PROPOSED.

NEW YORK January 10, 1890.

To the Editor ELECTRIC AGE.

Dear Sir:—The fraternity should be on deck in '92 for the World's fair, ready to ask representatives of all nations to compete with us in the matter of rapid telegraphy, and I think we should have fast sending contests in 1890 and '91, to bring out our best talent and prepare us for the grand International event.

I propose to undertake, with the co-operation of the telegraph journals, to conduct the tourney for this year, and the success of the affair will depend upon the enthusiasm and support of the craft.

I would suggest that the matter used by the senders in the last tournament, with the record of the first four contestants be published in the *ELECTRIC AGE*, *Electrical World*, and *Railway Telegrapher*. This could be used as a guide for operators in gauging their ability, and should they find themselves unable to lead or equal the record of fourth man in that trial it should satisfy them of their inability to compete successfully in the coming one.

I think early in April a good time for holding the tourney.

CLASSIFICATION.

Class A.—Open for all. Entrance fee \$2.00

Class B.—Open for all, barring those who are entered in Class A. and J. W. Roloson, W. M. Gibson and F. J. Kihm, who outclassed all others in the last tournament.

Ladies Class.—Free for all.

The nature and value of prizes which will be announced later on, will depend upon the substantial responses to this call. All who are interested in making the affair a success, will have an opportunity to aid it.

If possible the contest should be concluded in one evening, and as there will probably be a larger number of entries than ever, perhaps it would be better to limit the number of words to 250; then we could handle about 25 contestants in three hours.

It is generally conceded that the best way to decide upon the merits of the sender is through competent judges, as formerly, and the following named well-known gentlemen and representative telegraph men have kindly consented to act in that capacity: Walter P. Phillips, General Manager United Press; Geo. E. Holbrook, Prest. Telegraphers Club; E. F. Howell, Official Tester for W. U. office.

Applications for entrance may be sent to me at any time, the fee to follow before March 18th, on which date the entries will close.

I will refer to other details in a future communication and keep the *AGE* fully advised as matters progress.

Yours very truly,
FRED CATLIN.

DETROIT NOTES.—“Doctor” Alf Lawther has resigned and will hereafter devote all of his time to his practice. His many friends wish him success. Mr. H. C. Ostrander has a brand new bride. We extend congratulations. Messrs. Coleman and Freeman have returned from holiday vacations. La-Grippe has been having pretty much its own way here, and the force has looked thin for the past two weeks. Business having fallen off however the management has not been seriously cramped thereby. There is a pretty straight rumor afloat that several men will be dispensed with within a day or so. The *AGE* is growing steadily in favor in this part of the country.

NEW YORK TELEGRAPH CLUB NOTES.—President George Holbrook is in receipt of the following letters, which speak for themselves. Mr. Henry Guy Carleton is one of New York's talented newspaper writers. He says:

MY DEAR SIR: It gives me great pleasure to acknowledge the receipt of your note, dated Dec. 6th, 1889, notifying me of my election as an honorary member of your club. A long absence from my club kept me from receiving it until to-night.

As a plug who has not improved for eighteen years, I have always taken a keen interest in telegraphy, and old operators who have heard my interpretation of Morse have told me, with tears in their eyes that no such operator as I am is at present in the business. During the yellow fever epidemic of '78, in New Orleans, all the lightning experts died and yet I lived, showing that a wise and cautious Providence is over us all.

Once I grabbed a key on the Chicago *Tribune* wire and sent a special. I achieved 37 words the first minute, and was making fast time on my second lap, when the man on the other side of the quad asked me, if I wouldn't please use my other foot. This coarse remark prevented my making a record of which I might since have been proud.

The honor conferred upon me is one I little deserve, and yet one which I shall always hold very dear. Nowhere in the world, I know, is so much patience, skill, perseverance, intelligence, fidelity, discrimination and nervous energy exchanged for so little money, as in what I would be proud and happy to call "our craft." The wires are said to make the whole consistory of nations one family. This is not true. What has accomplished this result is the united brain of the men who work the wires.

My "73" to the club. At some meeting I should like to be present. I accept your honor and I thank you. HENRY GUY CARLETON.

Mr. Thomas F. McLaughlin who was buried on Sunday afternoon, Dec. 29th, has been identified with telegraph companies in this city in various capacities such as clerk, collector, etc., for more than 30 years. He was always upright and fair in his dealings with his fellow men, and made many friends, a large number of whom attended the funeral. His was the first death that has occurred among the members since the formation of the club. He was admitted to membership August 8th, since which time up to a few days prior to his death his face was familiar to all who visited the rooms.

A set of resolutions presented to the wife of deceased was most beautifully lettered by our esteemed friend, Mr. W. A. Van Orden, to whom on behalf of the club, the President desires through this medium to return his heartfelt thanks. Those from the club who attended the funeral and acted as pall-bearers were: president, Geo. E. Holbrook; secretary, J. C. Watts and Messrs. J. C. Callahan, R. J. Marrin, Wm. Eason, Joseph Van Cura, J. Stacom and Wm. Mills. The interment was at Calvary.

Our esteemed contemporary, *The Railway Telegrapher*, will unquestionably look into the merits of the following "ad," which is now standing in the Kinderhook, N. Y. *Rough Notes*:

WANTED.—Young Men to learn Telegraphy. During the term a general knowledge of railroad station agent's duties can be learned. Situations as station agents or operators ready as soon as qualified. For terms, etc., call upon or address, FRANK WHITEMAN, Ghent, N. Y.

Mr. John O'Brien, whose wife was called to New York several weeks ago by the death of her mother, is still "going it alone."

NEW YORK WESTERN UNION NOTES.—E. F. Stevens has been transferred to the Cincinnati *Commercial Gazette* Bureau, to take the place vacated by Mr. W. B. Richardson. Messrs. Grimes, Pnelan, Kelly, Sawyer, Lane, Skinon, Jackson, Horace, Davenport, Wood, E. G. Smith, A. E. Nolan, Craig, Crowell, McGinnis, Wier, and S. Crary, are on the split trick. From all appearances the coming ball of the New York Telegraph Club is destined to become one of the most famous that has yet been held in town. The article in last issue announcing the place at which this entertainment is to be held as Turn Hall, is misleading. The affair, which is to be strictly first-class in every respect, is to come off in the newly erected Central Theatre, in 67th st. It is without a single exception one of the most magnificent places of its kind in the city. The arrangements will, of course, be perfect in every particular. No one need hesitate to extend to the most fastidious an invitation to be present. Everyone seems interested in this, the first undertaking of its kind, under the auspices of this well-known club. Wm. Yackley, who for a long time past has worked the Fall River wire, is confined to his home by reason of an illness of a serious character. It is hoped by all that "Yac," who is one of the brightest men employed in the Eastern Division, may return to us in the restoration of perfect health. Messrs. Jessen, Hons, O'Brien, Riddick, Flynn, McGinnis, Clamputt, McNamara, Rath, Thompson, O'Connor, Fitzpatrick, Cross, Gregg, Mahoney, Lee, McGill, Minthurn have been reassigned to the regular day force. Most of these gentlemen have been returned from pool-rooms, that owing to a new municipal law have been closed until such time as questions of importance now before those in authority shall have been settled. J. A. Wright has been dropped from the list, owing to ill health. T. F. Meyer, S. Lynch, J. Porter, Wm. Scully, E. Wedin, H. J. Dunley and McGee, have been assigned to the 5.30 P. M. force. Mr. Guerin now comes on at 9 A. M. instead of 6 o'clock P. M. he having changed with Mr. A. P. McCarthy. Mr. Frothingham of the 6 A. M. to 3 P. M. force has resumed work in a condition critical in view of the desperate struggle he has for a week past had with diphtheria. Martin Erwin has gone to the Chicago *Times* bureau, to take the place rendered vacant by the transfer of Mr. Ed. Morrison to the regular night force here. During the absence of Mr. George Allman, Mr. John R. Powers succeeds him in charge of the New York *Tribune* office. Failing eye sight compelled Abe Booth, of the *World* office to relinquish his position temporarily and he has therefore changed with Charles Schram, of the day force. W. E. Beckley, has been transferred to the 7.30 force. Mr. Thomas Ashcroft, is for the present identified with the *Associated Press*, he having accepted a position on the split trick there. Messrs. Doyle and Heelan, of the 5.30 force have resigned. Garry Russell has been transferred to the waiting list. Messrs. S'ocum, of the 5.30 force, and Crary and McBride of the split trick, have been transferred. The AGE in its new dress and immense volume of reading matter, gives general satisfaction. Members of the New York Telegraph Club are highly gratified over the receipt at their rooms of a magnificent wine-colored binder, in which to file copies of the ELECTRIC AGE for future preservation. Your correspondent has been asked to acknowledge its receipt and this he does with thanks. Senator Ives, who works 51 East, has been absent for several days visiting friends and relatives in Utica, N. Y. He returns in the enjoyment of perfect health. A large number of the operators here, male as well as female, are laid up with the grip. Their ultimate recovery is earnestly hoped for. Richard Power, who during the Rebellion was employed as chief train dispatcher of the Military Railroad with headquarters at Alexandria, and who for some time past has been employed on the East, is confined to his home at Jersey City with the grip.

When the destruction of the St. Louis office became known in the main office in this city, those among the operators who had at former

times worked in that office, recalled the generally unsafe condition of the building in which it was located.

"The whole thing from cellar to attic," said one man, "was a rat trap. Think of it," said he. "In less than two minutes after the discovery of the fire the men were forced to flee for their lives, and this too at the bewitching hour of 6.40 A. M. What would it have been two hours later? Two minutes after the all-night force had been apprised of their danger, they had snatched from the hooks the unsent business, grabbing the books and such official documents as were of value, and through the blinding smoke made their way through the Wheatstone department to the fire escapes, and so down to the street. Bear in mind, my dear fellow," said the gentleman, "that this building was no rookery; it was a six story brick in the very heart of the city."

"How the fire originated I don't know, but this I do know; that only the morning before the electric light wires, which are conducted on rafters of wood, became ignited, and no less than five wires had to be cut in order to distinguish that number of fires.

As near as I can learn the fire broke out in the engine room, which is situated two flights below, and back from the counting-room. An excellent draught for a fire originated in this quarter was afforded by the smoke stack, which running up in a small narrow court near the building, served as a flue. The central and rear portions of the front of the office, as well as that of the entire Wheatstone department, is in ruins. Nothing remains of any possible service as the roof fell in and destroyed everything of value and usefulness.

That portion of the building, including the counting-room, superintendent's office, and the C. N. D. together with half of the operating-room remain intact. The switch board, as well as seventy sets of instruments, are now in ruins. The building contained among other things the necessary supplies for that district, all of which are destroyed. Fortunately no one was injured.

"Supplies from Chicago reached there last night by two special trains. I am informed, and if this be true it is to be hoped the new Western Union building to be selected there will not as was the former one be a menace to the lives of those who were therein employed, nor an eye sore to passers-by, but rather instead an ornament to the city."

THE TUG "WESTERN UNION."—The new steam tug, *Western Union*, which was launched last week is the product of a Philadelphia ship yard. In model she does not differ materially from the ordinary large tugs which adorn the New York harbor. She was designed for utility, without regard to any considerations of grace or beauty. Her length over all is about eighty feet, her maximum breadth is about twenty feet, and she draws eight feet of water. She is a double-screw propeller, and in addition to her two engines used for motive power, she carries also two sets of steam cable apparatus—this machinery consisting of a gigantic reel, derrick, and other appurtenances indispensable for handling cables and designed especially for this vessel by officers of the company. Her hold will contain about twenty-five or thirty miles of cable. The deck is fitted up with a view to supplying conveniences to the men assigned to the boat for cable work. There are fourteen bunks, a mess room and a wash room, besides ample lockers for tools, materials, etc. She is said to be able to make fourteen knots per hour. The old vessel *William Orton* has been laid up for repairs, and her crew under command of Admiral Alexander Kline have been transferred to the *Western Union*. Admiral Kline is one of the oldest cable men around New York.

THE INVESTIGATION OF THE ELECTRICAL INDUSTRY FOR THE ELEVENTH CENSUS.

By ALLEN R. FOOTE.

1. The investigation of the Electrical Industry, to be reported in the Eleventh Census, offers an opportunity of great value to ascertain the true importance that the practical application of electric energy has acquired in industrial and social development. This opportunity should be made use of to the fullest extent possible. In all departments of endeavor an exact knowledge of existing and antecedent conditions is the necessary base from which to direct future action. Laws and actions based on assumptions, instead of ascertained facts, are the pitfalls of civilization. Whose action is not in accord with fact, though it be unknown to him, must pay the penalty of ignorance through the loss caused by his inevitable error. A business policy guided by ascertained facts cannot fail.

2. Some managers of electric lighting and power stations have intimated to me that there are certain features of their business concerning which they do not desire to answer inquiries. They have acknowledged at the same time, however, that information regarding those very points, if given by other companies, would be more valuable to them than any other data that can be obtained.

So strong is the repugnance of some persons to the invasion of what they consider their private affairs, that sworn agents of the Census frequently find it difficult to obtain the information to which they are legally entitled. I believe the policy of secretiveness on the part of any individual to be a mistaken one, adopted either under a misapprehension of the facts or an ignorant view of his own interests. It may be stated as a fact that no person will be benefited more by the publication of an absolutely truthful statement, showing the operation of every company in the United States engaged in his line of business, than that person who doggedly refuses to answer inquiries, or retards the publication of the information to be collected by dilatory compliance with the requests sent him. A just punishment for his illogical selfishness would be to make his self-imposed isolation still more impenetrable, by debarring him from receiving any benefit whatever from the information given and work done by others. Such a person should be compelled to live where there are no mails, newspapers, railroads, telegraphs or telephones.

3. Information given to an agent of the census, cannot be used to the injury of the giver. The interest of the government can be served only by protecting the interest of the individual. Every agent is sworn to secrecy and is under as strict supervision as are the National Bank Examiners. Every publication of the information obtained is absolutely impersonal, so that it cannot possibly be traced to any individual or company unless it should happen that but one person or company is employed in the occupation described. While these regulations offer protection to the individual, they at the same time offer him, in full and equal exchange for the information he can give, all the information obtained from every person in his line of business. The exchange is a thousand for one—a consideration worth an hundred times more to any other person or company than the cost of the effort they are required to make to obtain it.

4. In no department can the benefits that a citizen may derive from well organized and intelligently directed governmental action be better exemplified than by the operations of the census office. The main features of the industrial information wanted are plain statements of facts, which any well regulated business concern can furnish easily and promptly, from

the accounts kept by themselves for their own advisement. To provide for the lack of uniformity in accounts and to inform all persons interested as to what inquiries they will be expected to answer, schedules are furnished months in advance of the date on which the information is wanted. This enables each concern so to keep account of the items that, on the day from which the information must bear date, an accountant can easily fill up the entire schedule and mail it to the Census Office. The advantages to be gained by individuals and companies in doing this, are a most generous return for so simple and easy an undertaking on their part.

5. The magnificent exhibition of co-operation with the government, that would be shown by simultaneously mailing a properly filled schedule to the Census Office on the same day by every company or person interested in the Electrical Industry, would mark the advance line of progress in census taking. Those who are placing this great agent of power, electricity, at the service of every citizen and municipality, by doing so will but sustain their well merited title of "Lightning Engineers." Really it is but a simple thing to do. It only requires that each one shall demonstrate himself to be the peer of the sun in his ability to do things on time. All things done require time for their doing. It requires no more effort to do a thing at a proper time than to do it at any other time. Who so orders the doing of them that each is done when required, liberates himself from the law of necessity and makes himself master of circumstances. All that is required in this case is that each company shall designate an officer or employee as the person who will furnish the information desired by the Census Office, and hold him responsible for having it ready on the mailing date.

6. The lack of information that may be obtained through the Census report has been felt so keenly that no less than ten individual attempts by as many central station companies to gain some part of it, have come under my observation during the year 1889. These attempts have been expensive to their originators, and troublesome to those to whom they have made their appeals. Worse than this, they have been unsatisfactory, because too limited in the scope of their inquiries; and dangerous, because they have not covered all the factors necessary to a correct statement. Public or private action based on insufficient data can but be ill-advised and disappointing. Such disadvantages may now be overcome with the greatest ease, to the injury of none and the advantage of all, if each person in interest will promptly and fully supply his own quota of Census data.

7. It is not the business of the Census Office to report or to prove the correctness of theories. It is its business to report facts. No person should be so eager to know facts as the man with a theory. If the facts are with him, he will be enormously benefited by their helpfulness. If they are against him, a knowledge of them may save all disastrous loss. No man ever attained a success by remaining ignorant of the facts pertaining to his occupation. The electrical industry is so young, it is almost too soon to attempt to separate the experimental from the practical. No feature of the wonderful progress made, which may now be recorded, is removed from its experimental stage by so much as a single decade. In view of this, it will be well to take notice of every experiment that is now being practically tested. Such a record will possess great interest for those who may be privileged to compare the results of the eleventh with those of the twelfth census. The experiments of to-day will furnish the best landmark for the progress to be recorded in 1900.

8. The report of the investigation with which I am intrusted will be the first official chapter in the history of the practical application of elec-

tricity to the uses of light and power. I do not assume the ability to write a report that shall be perfectly satisfactory to the 65,000,000 critics in the United States, not to mention those in foreign countries, to whom my work must be submitted. What I shall do is to give every person who may criticize me adversely, after my report has been published, a good opportunity to place himself on record by making suggestions to me while the work is in condition to be benefited by them. No more time will be required to write a suggestion before, than to write a criticism after the work is finished, *but much greater genius.*

The wisdom of foresight is far more rare and valuable than the wisdom of hindsight. To look ahead to an objective point, and form plans which, if followed, will make one sure of getting there, is a work of immeasurably greater value than to look backward and tell how present conditions came to be so. The historian of events, real or imaginary, can never be a leader. Who declines to suggest, deprives himself of the right to criticize. Through the courtesy of the electrical press, I urge every one interested in the electrical industry, each from his own point of view, to suggest to me every item of information that, in his opinion, should find a place in my report, together with his idea as to how it may be most easily and correctly obtained.

9. In my opinion the facts to be reported form two distinct classes:

First. Facts of the present value, the full benefit from which will be realized at the time of publication.

Second. Facts having a future value, the full benefit from which will be realized ten years hence, when comparisons are made between the results shown by the eleventh and twelfth censuses.

10. There are a multitude of facts of very great value to those directly interested in the industry that have no value to the general public, except in an indirect manner. The collection of such facts will be admitted by the voluntary co-operation of those to be benefited in supplying them. I shall be greatly disappointed if there is any failure in this regard, especially since Hon. Robert P. Porter, Superintendent of Census, has invited such co-operation in the following terms:

"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. It is confidently believed that those who are to derive the chief benefit from the result of the industry, viz: manufacturers and central station companies engaged in the distribution of electric currents for the commercial uses of light and power, will lend their cordial aid to render that result full and reliable. A formal response to the questions of the schedule is all that can be insisted upon, but the superintendent solicits beyond this, the hearty co-operation of everyone interested in respect to furnishing information promptly and accurately, in the procurement of additional facts, and in the suggestion of pertinent and useful lines of investigation. Without such co-operation, intelligently supplied, the inquiry must of necessity be limited in its value.

"The census of 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. For this reason it is particularly desirable and essential that the investigation shall not only present a record of the industry as it exists to-day, but that it shall so classify and arrange the information as to render it serviceable as a basis for present action and of comparison for all

future reports. In view of these facts, the importance and value of such an investigation and the official publication of its results should in itself be sufficient to secure from every person addressed, a special effort to answer fully and promptly every inquiry. The exhibition of the birth of an industry and its growth, to the magnitude of an interest second to none in importance within the short space of a single decade, is a marvelous record of progress. In no other industry and in no other country has such a record ever been made."

THE WESTERN UNION ST. LOUIS OFFICE BURNED.—The building of the Western Union Telegraph Company in St. Louis was destroyed by fire on the morning of Jan. 8th. The fire was started in the basement by a wire coming into contact with an electric light wire, and in a very short time the entire building was a mass of flame. Fortunately there were few persons around at the time, owing to the early hour at which the fire occurred, and all these escaped uninjured. All communication with the office by wire was of course completely severed, and for the present the business is being handled at East St. Louis. In the same building were the offices of *The Associated Press* and a few business concerns, all of which were completely destroyed. The total loss amounts to \$100,000 of which \$50,000 falls on the Western Union. The sleet storm of the day previous had coated the wires so heavily with ice as to cause them to sag and break. One of these wires became crossed with a light wire and caused the fire. The building was an old one and was situated on the corner of Third and Olive Streets.

Prof. Sheldon, in suggesting some points for an electric blowpipe, states that the pole of a powerful magnet strongly attracts or repels the electric arc, which may by this means be driven out sidewise into a point very similar to the point of flame projected from an ordinary blowpipe; at the end of this point the heat is intense, being sufficient to melt large copper wire constantly and to fuse any of the metals. It would serve admirably for welding, and a slight alteration would fit any arc lamp to perform the double function of lighting and welding.

It is shown by Prof. Hughes that a stranded iron wire cable has less self-induction than one of the same mass of metal formed into a solid wire; the explanation of this being that the circular field of magnetic force round the axis, which exists inside the wire as well as outside, is not so strong in the interior of the stranded iron cable as it is in the interior of the solid iron rod. The stranding reduces the magnetic permeability along lines which are circles described around the axis, and hence reduces the self-induction.

An electric locomotive of somewhat novel design has just been built at the New York Locomotive Works, Rome, N. Y., for W. H. Darling. The storage system is used, the batteries occupying what would be the fire box in an ordinary engine. The reciprocating movement of the pistons is caused by currents in helical coils wound about the cylinder, the construction being founded upon the principle that an iron plunger will be drawn into a coil of wire through which an electric current is passing.

In Cincinnati, last week, the question of ordering electric light wires under ground was referred to a special committee of five from each of the three city boards, to devise ways and means of accomplishing the task.

Russian officials have decided that the telephone is "dangerous to the State." In Warsaw orders have been given that telephones be removed from all restaurants, coffee houses and liquor saloons. Similar orders have been issued in all other large Polish towns.

THE COST OF ELECTRIC PLANTS.

Mr. O. P. Loomis, an electric expert of this city, was interviewed the other day by a reporter for a daily paper on the subject of cost of electric light plants. Mr. Loomis said the cost is "not so much as is supposed by people unfamiliar with such matters. The companies generally charge so much a lamp for the electrical outfit. Thus we will suppose that a shop or an office building wanted to put in a system of 300 lamps. That would require to start with an engine of 30-horse power, for the calculation is that 1-horse power will run 10 ordinary lamps. The best dynamos run 11 lamps per horse-power. A good engine will cost, say, \$750 set up. Then the dynamo, the wires, the switches and the lamps must be provided by the company owning the system decided on. These will cost about \$10 a lamp for 300 lamps if for an office building or a hotel, but for a factory not over \$8. The difference is in the finish of the brass work, the trouble in running wires to the places where wanted, etc. In a hotel much care must be taken in such matters. In a factory we have no hard-finished walls to take care of. A little over \$3,000 would pay for a factory plant of 300 lamps. No account is made of the boiler, because in all buildings where such plants are wanted there is commonly a surplus of boiler capacity on hand.

"The lamps cost 80 cents each, and are warranted for 600 hours. If a good system is adopted there is no occasion to hire an expert to care for the plant. An engineer fit to trust with a steam-engine is capable of caring for the plant. The dynamo lasts a lifetime, so do the wires, and an intelligent boy screws on a new lamp when the old one wears out.

"The running expense of the system depends on the cost of coal. It takes about five pounds of coal per horse-power, per hour, in an ordinary building. If a good condensing engine is put in, then the consumption of coal is reduced below that. A ton and three-quarters of coal should run 300 lamps twenty-four hours.

"If smaller plants are wanted, say, twenty-five or fifty lamps, it costs from \$12.50 to \$13 per lamp for the electrical plant all in and ready to set going. In spite of what has been said about fires, the electrical plants are much safer than oil or candles or gas. The insulation does not wear out when properly put up, because there is nothing to wear it out, if exposed to chafing, as it would be if the wire hung where it could swing against a post or a wall, the rubber will wear off. That is the fault of the man who puts up the wires."

A novelty is announced in the shape of a "recording and alarm" compass which, it is declared, will greatly increase the safety of vessels. The apparatus is said to be composed of a binnacle and recording and alarm instruments connected by electric wires. The principle, in brief, is to sound an alarm whenever the course is not kept.

The transmission of electricity by insulated wires was shown by Watson in 1747; telegraphy was invented by Morse in 1837; the first Atlantic cable was laid in 1857, and the quadruplex system, by which four messages may be sent over the same wire at the same time, was first used in 1877.

The novel sight of two Edison phonographs in charge of half a dozen men coming out of Grace Church, New York, attracted considerable attention January 2nd. The machines had been placed in the belfry the evening previous, and the New Year's chimes recorded. A cylinder, containing one of the pieces played, is to be placed in a cedar box and preserved in the church. The records of the tunes are very loud and accurate, and will be heard at phonograph entertainments this winter.

KANSAS CITY'S ELECTRIC LIGHT COMPANIES.—The Kansas City Electric Light Company is the oldest organization of the kind in the city, having been organized in 1881. It is the licensee of the Thomson-Houston system of lighting by electricity. The capital stock is \$450,000. It has a plant with a capacity for 930 arc lamps, 700 of which are in use, and 1,500 incandescent lamps, employing both continuous and alternating circuits. Ten engines are required, and they are of the Corliss, Ide and Armington-Sims make; seven boilers, three of which are Babcock & Wilcox and four common tubular boilers. The power employed aggregates 1,200 horse power. During the past year, \$77,676 have been expended in real estate, additional power plant and street system. A building has been purchased and remodeled and a large amount expended in lines, poles and lamps. The works are on Eighth and Santa Fé streets.

The Edison Electric Light and Power Company was organized in 1888. The company has a capital of \$100,000, with an investment of nearly one fourth more. This company is the licensee of the Edison system and its plant has an aggregate capacity of 6,000 lamps, 4,000 of which are now in use. Three New York safety engines and three Babcock & Wilcox boilers are used. They serve electrical currents for power purposes as well as light. Some of their wires are under ground and some over head. The company's central station plant has been erected and fitted up during the past year at a cost of \$125,000.

The American Electric Light Company's plant is located at Twentieth and Central streets. It has three boilers and three engines. They use the Ball and American arc light dynamos, supplying 250 arc lights; the Heisler incandescent system, one dynamo, furnishing 300 incandescent lights. The company's service has more than doubled during 1889, and \$7,000 has been expended during the year in building, new machinery and other improvements.

The Interstate Electric Company has increased its capacity during the past year from 2,500 incandescent lights to 10,000 and its horse-power from 100 to 500. It is the only company using storage batteries. There are four battery stations in the city. During the year Paul W. Bossart has retired from the management and has been succeeded by T. F. Clohesy. Mr. Clohesy has gone to New York to purchase more machinery. The office has been removed from the Keith & Perry Building to 222 West Fifth street. Kansas City will continue the Western headquarters for the company.

The Sperry Associate Electric Company was organized in 1886. It has a capital stock of \$30,000 with nearly double that amount invested. It has an arc light plant of 300-lamp capacity and has recently started a new Westinghouse plant with a capacity of 3,000 lamps, at a cost of \$30,000.

On the Boulevard des Capucines, in Paris, it was noticed recently that horses manifested considerable uneasiness on passing over a particular portion of the roadway. The electric light company was communicated with, and on the roadway being dug up it was found that the lead cover of the branch conductor to the street lamp was in contact with one of the bare main conductors, and as the neutral wire was faulty in several places a circuit was completed through earth between the lead cover and the neutral wire. The iron hoofs of the horses made excellent contact with the damp wood of the roadway, and the unfortunate animals consequently became a shunt on this leakage circuit and received smart shocks.

The trestle carrying a trolley on one of the Boston roads, a few days since, fell with a crash on a passing car, greatly frightening the passengers.

OLD-TIME TELEGRAPHING.

The late John Butterfield, of Utica, was one of the first friends Prof. Morse, the inventor of the telegraph, had in this country, and he, with the late Commodore Greenman and Theodore S. Faxton, of Utica, built the first line of telegraph after the Government test had been made between Baltimore and Washington. For years Prof. Morse depended for support upon the dividend of the stock held by him in the New York, Albany and Buffalo Telegraph Company, which had its headquarters in Utica, until the Western Union Company swallowed up all eastern lines. A Syracuse business man has discovered among his papers a statement of the accounts of the New York, Albany and Buffalo Telegraph Company for 1853. It didn't take a very large sheet of paper for the report. John Butterfield, of Utica, was the president of the company.

In old times the receipts and "checks" of offices were footed at 6 p. m., and the footings, with the amount of business done between each office, telegraphed to Utica. At 9 a. m. on the following day the business of each office was known to Secretary Chapman and the Utica directors. The only exceptions were Valatie, Croton Falls, Palatine Bridge, Waterloo and a few smaller offices which frequently failed to report for a week at a time, and then they rattled off the old story week after week—with only occasional changes—"Cash nothing, received for other lines nothing, check nothing!" Now the receipts and profits of the Western Union Company amount to millions annually, but there was more fun (for less pay) in telegraphing in the "fifties" than there has been of late years.

ST. PAUL NOTES.—Among the social events of the season was the marriage of Mr. L. F. Wise to Miss Mattie E. Barlow, of this city, at the residence of Archbishop Ireland. Mr. and Mrs. Wise were the recipients of many costly presents, among which was a very elegant silver tea set from his fellow associates. The happy couple had the good will of all their many friends for a life of joy and happiness. Mr. Wise is one of the oldest employees of this office and universally liked. The following is a list of subscriptions from the different offices of this State to the Miles-Igoe fund:

St. Paul, W. U. office . . .	\$105.00
St. Paul, No. Am. office . . .	14.00
Minneapolis, W. U. office . . .	127.00
Helena, Montana	36.00
Sioux City, Iowa	34.50
Fargo, Dakota	6.50

Making a total in all of . . . \$323.00

The presentation was made by Mr. F. X. Benton, of St. Paul, and Mr. J. C. Mann, of Minneapolis. The wives of the deceased operators were greatly affected, particularly as the money came from those associated with their dear husbands in business, and they greatly thank me and all for the manner in which they responded so nobly in this trying ordeal. Following the sad deaths of Operators Igoe and Miles comes that of our all-night chief, Mr. A. D. Fowler, who, after an illness of five weeks with inflammation of the bowels, died Friday morning, December 20th. Mr. Fowler was quite a favorite in this office and always willing to lend a helping hand to those in need. His death is quite a blow to this office and his many friends. Mr. Cranley, formerly of Chicago, has been appointed to fill the vacancy caused by the death of all-night chief Fowler. There has been little or no change in this office of late. Departures—Ed. Cullen to Helena and J. Darrah to Spokane Falls. Arrivals—Messrs. Goodwin and Greene. Mr. Geo. Taylor, formerly manager, Board of Trade, Minneapolis, transferred to manage "X" office, St. Paul, vice Jim Bell, who goes to Watertown, Dakota, and Mr. Hancock to Prairie, Dakota. Mr. E. Wigg, after an absence of several weeks, returned to St. Paul with a charming wife from the East. He has our best wishes for a bright future. Mr. O. M. Mitchell and family, formerly of this office, are visiting friends in this city. The genial face of Frank Woodward is

again seen in our office. Business is holding its own here.

BOSTON NOTES.—The influenza invaded the W. U. office and played considerable havoc in nearly every department of the service. The operating room presented a demoralized appearance just before and during holiday week; the operators going about their work in a half-hearted way, with coat-collars turned up, as if to ward off the approach of the disease. At the present writing, however, the list of absentees is daily growing smaller, and we are pleased to say that no serious cases have been reported. Night Manager Pond and Night Traffic Chief Knowlton were at one time both prostrated by the disease and unable to report for duty. Mr. J. B. Colson officiated in Mr. Pond's place, while upon Mr. R. W. Nason devolved the duties of traffic chief, which, by the way, he was perfectly familiar with, as he had before been called upon to act in that capacity. Day Traffic Chief Kelly was also a distinguished sufferer from La Grippe. Fortunately Mr. Kelly's illness was of short duration, and he is once more at his post. Assistant Quad Chief T. J. Clifford is on the sick list, though not a victim of the influenza. On account of ill health he has been advised by his physician to rest for a month or two. His many friends sincerely hope he will return to his duties invigorated and improved in health. His position is being temporarily filled by Mr. T. R. Finan, of the Portland quad. This leaves that wire without its regular men, as Mr. Wallace Cox, Mr. Finan's side partner, is at home sick, though we hear he will soon report for duty. Operator J. S. Sullivan, formerly of 109, died of consumption last month. His death was not unexpected, as he has been ill for some time. He was a member of the Boston Aid Association, the representatives of which attended him with commendable promptness and regularity during his illness at his home in Dorchester. At his funeral the association and fraternity were represented by Messrs. President Tobin, Vice-President Harrington, Devine, Gillespie, Riley, McGrath, Wigmore, James, Coughlin, and J. O. McFarland. "Bob" Booth, an old-timer, fractured his shoulder while on a fishing trip recently, and is confined to his home in Fall River. Mr. W. J. Ryan returned from a two weeks' vacation January 1st, greatly improved in health and looking fine. Mr. J. F. Sheehan was recently married to an East Boston lady. We extend congratulations. Messrs. Arthur Pratt, Martin O'Donnell and Miss Hattie Cameron have accepted positions with the Postal in this city. Mr. Perley Henderson, son of Manager Henderson, is a recent addition to the day force. Mr. J. W. Nagle, well known here in '84-'85, has been assigned to the Portland quad until Mr. Clifford's return. Mr. Frank Murphy, a Boston boy, and a rising young operator, has resigned to accept a position as assistant operator with a first-class broker establishment, whose increasing business demanded the services of an extra operator. We congratulate Mr. Murphy upon a change as agreeable as it was unexpected. Reports from Denver, Colorado, of the serious illness of Mr. J. A. Herrick, who went West for his health some time ago, have been received by his friends in this city. As Mr. Herrick has stopped working by advice of his physician, it is hoped that future reports of his condition will be more favorable.

THE WESTERN UNION DENVER OFFICE.—The Denver office of the Western Union Telegraph Company, located at 1314 Sixteenth street, in importance is second to few of the hundreds of large offices of the same corporation throughout the country. Mr. T. B. Wells is the manager, and under him are C. I. Copeland, chief clerk; D. A. McCammon, chief operator of the day force, and George E. Lawton, chief night operator; forty-five operators, twenty-two clerks, thirty messengers, making with five other employees a total force of about 100. Mr. Wells has been connected with the Western Union Company for fourteen years, most of the time at this point, and he stated to a reporter for *The Republican* in a recent interview that the business handled at this point is on the steady increase annually, and in order to meet the require-

ments of the volume of business he has been compelled to make constant additions to the working force. "The Denver office," says Mr. Wells, "does no relay business except for State points, all overland business going by way of Cheyenne and New Mexico points, but our business for 1889 shows an increase above that of 1888 of more than twenty per cent., and the fact that the telegraph is coming into more general business use leads us to expect a corresponding increase for the ensuing year. The business is much heavier than ever before and requires the constant working of thirty-five circuits to meet the demands of our patrons." Mr. Wells volunteered the statement further that the Associated Press and private newspaper dispatches received at Denver amounted to 15,000 words daily, and the amount transmitted from here would about equal that sum. In conclusion Mr. Wells remarked: "From the indications noticeable in our business, I am forced to admit that while the year just closing has been the most prosperous in the history of this city and State, for the next year we anticipate even a more marked era of prosperity, and are making preparations for it in our business, at least."

PORT ARTHUR, ONT., NOTES.—Your correspondent has much pleasure in reiterating a statement made some time ago to the effect that the AGE is becoming very popular among the fraternity on this division. Its true worth is, I am glad to see, being more highly appreciated. I hear the opinion expressed that it is, undoubtedly, the very best and the cheapest paper of its kind published. "It does not come often enough;" "it should be a weekly," etc., etc. To an observant eye it is pleasant, indeed, to note and watch its growth.

BROCKVILLE, ONT., Jan. 6.—We have never yet seen in the columns of the AGE a description of how the fraternity is represented in Brockville and think it about time it was done. In the C. P. R. commercial office we find it under the able management of Mr. Geo. E. McGlade, ably assisted by Mr. Archie Graham as clerk, down stairs, and relief operator. The operating department is looked after by Mr. Geo. Rutherford. In C. P. Railway office Messrs. "Joe" West and Geo. Clough work alternately day and night week about. Mr. K. G. Starr looks after the telegraphing in freight agent's office at the wharf. The Great North Western office is well managed by Mr. John W. Baker, with Miss Jessie McLennan as chief operator, while Messrs. "Josh" Caldwell and "Davy" Hamilton hustle business on the back wires. In the G. T. Railway office we find the old-timer Mr. "Bob" Widdis and Mr. Hunter. In Allen & Co.'s stock office Mr. E. Ambrose Driscoll collars the quotations from the ticker. Mr. Geiger is despatcher in the B. and W. Railway office, with Mr. McKinnon as operator.

SIoux CITY, IOWA, NOTES.—The AGE is a welcome visitor, and it seems utterly impossible to do without it. Miss Vinnie Russell will spend the holidays with her parents in Kansas City, Mo.; Mr. J. E. Dayhoff has returned to Chicago; Mr. F. V. Moffatt, Jr., of Davenport, Ia., succeeds him as manager of this office, and is proving to be a royal good fellow, kind and courteous to his men. He brings with him Mr. Bert Hood, who has charge of the book-keeping department. The packing houses are now enjoying the benefits of a direct Chicago wire for C. N. D's only, which is a decided improvement over the old plan of relaying them; it is useless to say they are well pleased with the service. The boys here raised \$50 for the families of Messrs. Igoe and Miles, who lost their lives at Minneapolis recently. The late arrivals are: Frank Heilman, from Mason City, Ia.; Sam. W. Welch, from S. C. and P. R'y. Departures: Sam. W. Welch to Sioux City and Northern R'y, as despatcher; W. J. Allen to Mapleton, Iowa, for the C. M. and St. P. R'y, nights.

CINCINNATI, O., NOTES.—Our force remains about the same, the old timers still hang on and consequently there are but few changes. Quite a number of us have had slight touches of the "grippe" and had to take to our beds, but all

are out again and hard at work. A long felt want has been supplied in the way of an eating room. Heretofore the operators have had no place to go to eat their lunches, but now they can find tables and chairs in an adjoining room prepared especially for this purpose. It adds greatly to the appearance of our office also. "Bob" Smith, who has been subbing here for the past two months, has not been around for a few days. Whether he has left us or is down with the "grippe" we are unable to say. L. S. Miller, S. G. Teter, Vernon Fritter, James R. Pigman and others, whose names we failed to get, spent the holidays with their parents, at their respective homes. Harry Cheeney, of the split trick, who has been visiting his parents at Gallipolis, O., for the past two weeks, returned to work Tuesday. A few weeks ago our force of check boys was cut very short, by the sudden departure of three or four of the boys, who went West, to fight the Indians; no doubt the cause of five cent novels, as several were afterwards found disclosing the secret. P. L. Warren, of the split trick, is visiting his mother at Norwalk, Ohio.

ST. LOUIS POSTAL NOTES.—The Postal office in this city is one of which the company can justly feel proud. It is situated at No. 419 Olive St. in the magnificent *Bank of Commerce* building, which occupies the north-east corner of Broadway and Olive Streets. It is a ten story white marble, and finished in the latest and most approved style; a better location for a telegraph office could not be wished for. The office has a frontage of 32 feet by 110 in depth, 22 foot ceiling frescoed, as are all the walls. Plate glass front, four large windows in the rear, and a mammoth sky-light affords ample light by day. For night it is equipped with gas, three large arc lights, and ten incandescent lamps. The front is fitted up in bank style, with glass of various colors. First we have the manager's office, then the cashier, receiver and delivery departments. Next we have on each side of the room, tastefully and conveniently arranged closets for supplies. Now comes the operating department, which has 12 quartette tables, cherry and ash, arranged on each side and in the centre of the room; a 50 wire switch board, set in a handsomely carved cherry frame, occupies the space at the rear and center of the department facing the front. At the left of the switch board is the chief operator's desk. The running of the wires, and arrangement of the board, is unexcelled for perfectness, beauty and convenience, the credit of which is due to that able and thorough electrician, Mr. George McGann. A "Message Carrier" conveys messages to and from the delivery and operating departments. We have in use eight quads, three sets of repeaters, and seven single sets of instruments. The battery is located in the basement and consists of 4,000 cells. The "Merchants Exchange" is equipped with four quads and five single sets. The office is admirably situated and nicely and conveniently arranged. The "curb" office is equally well provided for. There are branch offices at the principal hotels and prominent business centers. They have all the business they can handle both day and night. The veteran and well known telegrapher, Col. C. Dougherty, is manager. He is very popular with all, especially the business community, and to him the company is indebted for their prosperity and success in St. Louis. His staff is well chosen, for ability, fidelity, and popularity. Mr. George McGann, chief operator, takes rank with the foremost electricians, possesses remarkable executive ability, is quiet, unassuming, and popular, both in and out of the office. Charles F. Bartlett, assistant day chief, is a telegrapher and electrician of recognized ability. Thos. P. Wheeler (what old timer don't know Tom Wheeler?) is night manager and chief, the same Tom of ye ancient days. He fills the trying position to the letter. Mr.

A. K. Minor the gentlemanly and popular cashier and head bookkeeper, performs the service usually done by three men. Miss Ada Sampson, a very attractive young lady, is typewriter and assistant bookkeeper. Mr. W. A. Bruggeman who presides over the receiving and delivery departments, knows his business and attends to it. He is assisted by Mr. Richard Little. Mr. McGrath looks after these departments at night. Mr. Edward Altemus is manager on "change." He is very popular among the merchants, and all, who have the pleasure of his acquaintance. He has been manager on the "floor" for the various telegraph companies for the past fifteen years. In popularity and ability to control business, he is the "Hi Waters," of St. Louis. Mr. Edward L. Dougherty has charge of the receiving and delivery departments on the "floor." Following is the staff of operators; L. K. Hutchinson, James W. Cooke, Charles E. Smith, E. T. Patter, Charles Hughes, (late of Chicago,) A. D. Ellis, B. E. Black, Walter Anderson, George Hugh, Miss Mollie Landrigan, Miss Annie Mullen, and Miss Sarah E. Craden; Tommy Leahy, chief "check;" Hughes, Ellis, Cooke and Hugh, work at "Mx" during "change" hours. A. P. McDonald, an old and well known telegrapher looks after the interests of the Jones, Kenneth and Francis Boos private wire. Mr. Gerald G. Smythe performs this service for Norton and Worthington. Mr. Michael Kelley, and Mr. John McGann, two able and experienced electricians, look after wire trouble, etc. They are old W. U. men hence, know every foot of wire in the city, and any trouble occurring is soon removed. We appreciate the AGE, subscribe and pay for it, and think that all telegraphers should do the same.

THE NEW YORK TELEGRAPH CLUB ROOMS DAMAGED BY FIRE.—The expression on the faces of many of those who peered through the wired wicket in front of the cashiers' desks, at 195 Broadway, where they had assembled to receive on the last day of the year 1889 their semi-monthly stipend, wore a look of sadness. It was not because their owners had overdrawn their salaries; neither was it because they had made too great a number of holiday presents to see their way clear. But it was due solely to the destruction by fire of what they were pleased to call their home: for as such the rooms of the New York Telegraph Club have long been regarded by a large majority of its members. At 8:17 o'clock, according to the statement of Foreman Binns of Fire Engine Company No. 10, located almost directly opposite the club house on Fulton street, the first alarm was received. It was responded to with alacrity. The foreman himself was the first man to enter the rooms. "I found the front room," said he to your correspondent, "a mass of flames. It was hotter than a furnace. In fact, I never recollect in all my experience having encountered a fire confined to so small an area the heat from which was so intense." It is due to the efforts of these noble neighbors that the fire was not allowed to extend beyond the reception room. That the book-case in the secretary's room was badly damaged by the flames is true; but the library still remains in an almost perfect state of preservation. Mr. E. E. Brannin, a chief operator at 195 and one of the trustees of the club, was on hand in an incredibly short time, and he, together with Librarian Powers, rendered excellent service in restoring order out of chaos. His first step before leaving the office was to notify by telegraph the president, secretary, treasurer, and other officers, all of whom put in an appearance as promptly as possible. The destruction of the reception room—the one of all others in which the members took the most pride—was complete. Not a single large picture, with the exception of the recent contribution from Cleveland, O., remained intact. The strangest thing in connection with this picture is the fact that

while the frame and glass as well as a portion of the margin on which the photographs were mounted was destroyed, the facial expressions of these included in the symbolic figures "73" can all be preserved. Of the magnificent life-size crayon of Prof. Morse, valued at \$125, nothing remained but the frame and that was damaged beyond repair. The President's picture, as well as that of Mr. Thomas Edison, the Hon. John D. Reid, and in fact every large picture, with the exception of the one above noted, was completely destroyed, not even a vestige of the frames remaining. The magnificent solid silver water pitcher and goblet, presented to the club by the ladies of 195, was reduced to a flattened mass of metal, resembling more than anything else we can recall a huge pancake with a patent handle. The loss of this, the most useful, as well as one of the most highly-prized ornaments the room contained, was deplored by all. A copy of the ELECTRIC AGE was found in the debris unharmed. The glass covering of the pictures of the first four presidents of the Buffalo Electrical Society was, with the single exception of George H. Usher, broken. This is all the more strange from the fact that his, being nearest the entrance to the reception room, was therefore subjected to greater heat. That the club will be all that it ever was is fully demonstrated by the fact that the furniture dealers, plasterers, paper hangers and carpenters have been communicated with from a desire to render the rooms habitable with the least possible delay, and all are at work with the expectation of completing their labors within ten days or less. The matting in the billiard room being considerably worn, such of the Brussels carpet as was preserved from the fire has been used to take its place. It is the earnest request of the president that such of the honorary members as have not already done so will send their pictures to the librarian, Mr. John R. Powers, to be placed in the reception room. All those at all musically inclined—players and singers—will, if they will communicate with the president, learn something to their advantage.

NEW BRUNSWICK, N. J. NOTES.—C. W. Sedam of Steamboat Dock Office is improving from a serious spell of sickness. Operators Runyon of same office, and Joe Cahill of N. Y. office, had a good "Gripp" for several days, but lost it without serious damage. Their Electric Grip is still sound. Harry Ettinger of depot office, gave a magic lantern exhibition to his friends last week. This was followed by a solo, which he rendered in a creditable manner. Jim Cahill, an old-timer gave us a call during the holidays. Richards Cummings, formerly operator at Bridgeport, Conn., is home on an extended visit. W. F. Wineland, manager, assisted by F. J. Reilly are at main office, and handle business in the good old style. Richard Cadmus has accepted a position on the extra force of the Pennsylvania R. R. Co., and has strengthened his grip since pulling the levers. T. H. Mulligan, lineman, is still at this point, and keeping the wires in good shape.

The first number of *The Telegrapher* has made its appearance. It is published in Chicago by Mr. A. L. Davenport, who thinks the western operators ought to have a trade paper of their own and not depend entirely upon the East for their craft news. We wish the new addition to telegraphic literature a happy and prosperous career, and no doubt it will receive a hearty welcome and united support at the hands of the western telegraphers. The West is a great country, and the field is a large one for enterprise. *The Telegrapher* will be issued on the 1st and 15th of each month. Its dimensions are rather small, but it is far more commendable to start from a small beginning and develop with experience than to begin with a great hurrah and soon collapse.

Miss P. M. Bradley has accepted a position as operator in the office of the Brush Electric Light Company, Cleveland, Ohio.

MODEL ELECTRIC ELEVATOR INSTALLATION.

We present herewith a view of a recent hydraulic elevator installation made at the building of the United Security Trust & Safe Deposit Co. of Philadelphia by the Otis Elevator Co. of Yonkers, N. Y., and Chadbourne, Hazleton & Co. of Philadelphia, agents in Pennsylvania for the Sprague Electric Railway & Motor Co. of New York.

One of the first things which strikes an observer is the minimum of space required for every part of this installation. The pump was manufactured by the Otis Elevator Co. especially for this plant, and the arrangement for reduction of speed between the armature shaft and pump is made in the compact manner shown in the illustration. The motor operates the pump against a pressure in the tank, there being no overflow, and when the maximum pressure is reached, the motor runs empty, automatically cutting down the amount of electric current taken from the line, so that only sufficient current is used to supply the energy to keep the motor in operation.

WESTINGHOUSE COMPANY'S SALES.—During the first three weeks of December last the Westinghouse Electric Company, of Pittsburgh, secured contracts for alternating current apparatus, to be used at the following places: Salem, O., 750 lights; Louisville, Ky., 750 lights; Greenfield, Mass., 750 lights; Denison, O., 500 lights; St. Louis, Mo., 2,500 lights; Hamilton, Ont., 1,500 lights; Denver, Col., 3,000 lights; Pittsburgh, Kan., 750 lights; Pueblo, Col., 750 lights; McKinney, Tex., 500 lights; Portland, Ore., 6,000 lights; Lynchburgh, Va., 750 lights; Dansville, N. Y., 500 lights; Batavia, N. Y., 750 lights; Pittsburgh, Pa., 3,000 lights; Oldtown, Me., 750 lights. Arc light machines of a capacity of 250 lamps were sold as follows: Pittsburgh, Kan., 50; Portland, Ore., 100; New Bedford, Mass., 100.

"Whipple's National Electrical Directory and Electric Reports" is the title of a book just issued by Fred Whipple, of Detroit. This Directory will no doubt meet with a hearty welcome among electricians. It contains a list of all the associations in every branch of electricity, and clubs in the United States, including the names of the members of each. Every branch of electrical industry is very completely listed, and the book will be invaluable to persons who have occasion to learn the names of those engaged in any particular branch of electricity.

Three 7,000-pound dynamos are being turned out by the Eddy Company at Windsor, Conn. They will be of 45-horse power each, and are to be used for the deposition of copper.

The Commercial Cable Company paid their usual quarterly dividend of one and a half per cent. on the 2d Jan. last.

One of the special features of this hoist is the compactness of the casting, which was made expressly for this plant. It is in one piece, consequently greater rigidity is secured.

Before the installation of the electric motor at this place, a gas engine was used to supply the necessary power, but gas never proved satisfactory in this capacity, and the Sprague motor was substituted. This motor is now giving perfect satisfaction and the plant is one of the finest in Philadelphia. Our view is made from a photograph, and shows all the details of this installation.

The Citizens' Electric Street Railway, of Decatur, Ill., changed from horse to electric power last August, and has since been in successful operation. The road is five miles in length. The over-head wire system is used, and since the change travel has increased 100 per cent.

The power plant for the Fostoria, O., electric light company has been completed.

A most ingenious electric cash register has been brought out. When the cash drawer is pushed in after the requisite amount is deposited it must be wholly shut and locked; otherwise a bell will ring until this is done. Besides the drawer cannot be pulled out after attempting to close it until it is fully closed and locked; thus carelessness in closing the drawer is at once detected. At the close of business the door in front of the register is dropped, and on the dials is noted the total cash of the day in dollars, dimes and cents, so that the total amount of the day's business can be seen at a glance.

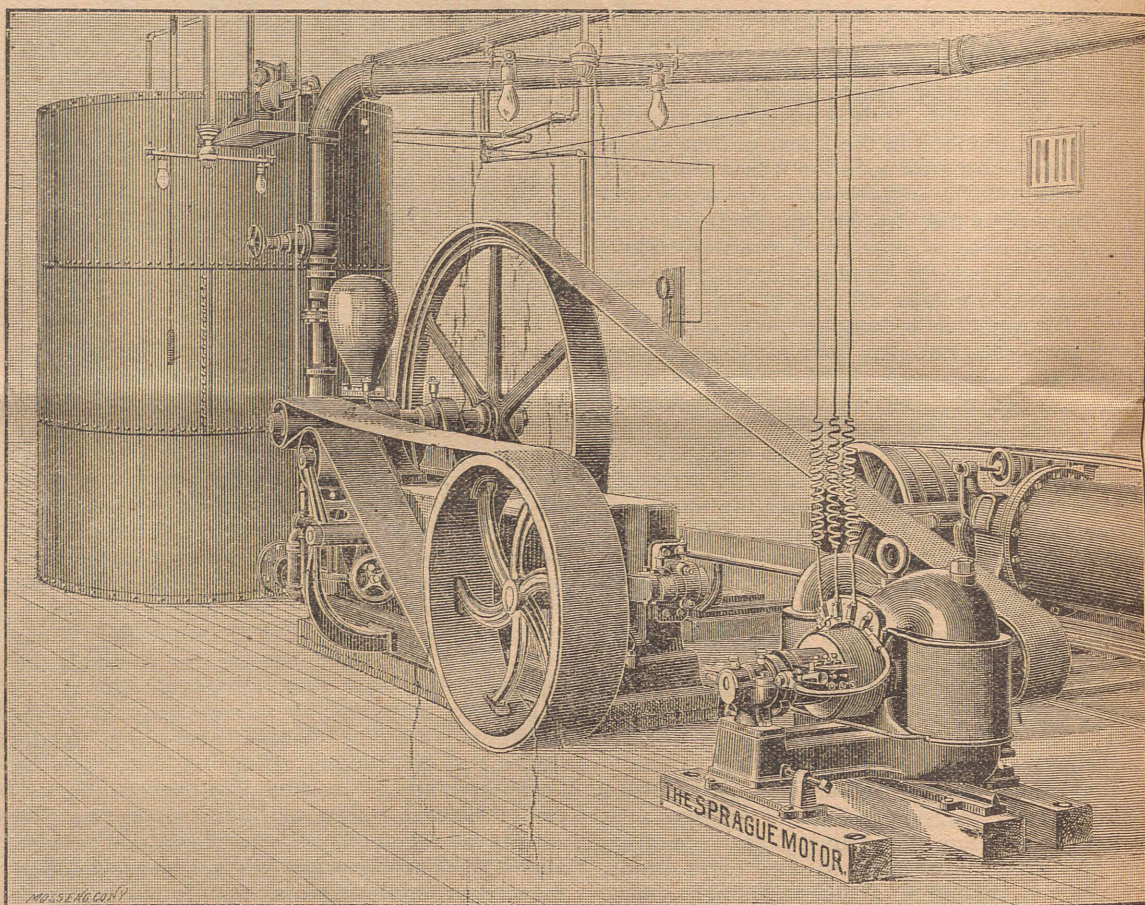
The opacity of steam issuing from a nozzle is greatly increased by bringing electrified points near it, and its color is changed to orange brown.

The Electric Light Company at Salem, Mass., has provided a library of works upon electricity for the benefit of its employees.

Pittsburgh Chronicle: An electric piano has been invented, and now its makers will try to introduce it into our ohms.

in the centre of the crib, which runs from the cellar to the seventh story. Each floor has four cut-out junction boxes, one on each crib or vertical main, and each junction box has four divisional circuits of $\frac{3}{8}$ -inch tube. The tubes run to three outlets each, coming out with an elbow and also returning with one, running to the next outlet. The building is wired throughout with flexible wire and cable. All feeders and vertical mains are single conductors run in one inch tubing. The divisional circuits are single tubes containing flexible twin conductors, and in no case exceed eight amperes. One of the principle features of this system is that the building was conduited throughout while in course of construction, and the conductors were inserted after the building was completed, thus showing that the wire can be withdrawn and replaced at will.

One of the treasures of the Edison phonograph works at Orange is a cylinder that was impressed with the voice of the late John McCullough, the actor, who died in a madhouse. The impression was taken while he was in confinement. Rambling passages from the



THE SPRAGUE MOTOR FOR ELEVATOR INSTALLATION.

BUILDING WIRING.

The acme of perfection in incandescent wiring is the system used in the new Metropolitan Telephone Building, in 38th St., between Sixth Ave. and Broadway, being that of the Interior Electrical Conduit Co. It was the writer's pleasure to visit that building a short time ago. On going into the cellar, the first thing out of the ordinary run of wiring that was noticed, was three neat black tubes about an inch in diameter coming in from the street service. These ran into a junction box about ten feet from the building line. At this point the system divides, running on either side of the building, extending along the ceiling to a distance of half the depth of the cellar, at which point they run into another junction box dividing again, one half returning half way to the front of the building, the other running to an equal distance back. At these points the tubes elbow upwards, running up the side of the building to the fourth floor—the centre of distribution; at which point they run into a junction box placed

plays in which he acted were recited in a voice of wonderful power and pathos, but at the end of each passage the actor would stop and say, in a voice to chill the blood, "But now I'm mad—ha, ha, ha, ha, ha, ha—ah-h-h-h." The end of the laugh was all but indescribable, for he drew in his breath with a sound that was partly a shriek and partly a gasp. If there is ever a voice heard from the tomb it is when this cylinder is put in the phonograph.

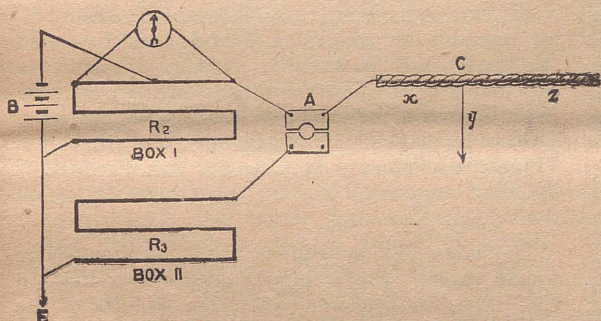
The trouble between Mayor Hart, of Boston, and the electric light companies has been compromised. Pending the signing of contracts for lighting the city at cheaper rates, the Mayor has agreed to let the Boston Electric Light Company, which supplies the bulk of the light, continue its service at the old figure, 65 cents per lamp a night. Some of the smaller companies meanwhile will extend their plants until they have circuits enough to light the city. When this is accomplished, contracts will be signed for 40 cents a lamp.

Mr. Edison is adding to his laboratory a collection of minerals.

THE BLAVIER METHOD OF LOCALIZING FAULTS IN SUBMARINE CABLES.

In a communication to the London *Electrical Review*, respecting the Blavier method of localizing faults in submarine cables, Mr. P. Chr. Dressing, of Copenhagen, says:

It is well-known that the Blavier method of testing suffers from the disadvantage of exposing the fault to a higher potential when the distant end of the cable is insulated than when it is earthed. The consequence is that the current through the fault to earth is of different strength in the two cases, and that the resistance of the fault which is a function of the current must vary between the two measurements. This difficulty can partly be overcome by using a smaller electro-motive force when the cable is freed than when it is put to earth, and the ratio between the two battery powers can be found approximately by calculation. But there are other sources of disturbance produced by the earthing of the cable, such as the shunt circuit formed by the length beyond the fault, and as these errors cannot be compensated for, it is only in some few cases that a localization by Blavier's formula can be relied upon. Refuge is then, as a rule, taken to the so-called "overlap methods" of testing from both ends of the cable, viz., localization by the two measurements with the distant ends insulated, or by the two measurements with the distant ends earthed. Both these, but especially the latter, have been developed into tests of great practical merit and accuracy by Messrs. A. E. Kennelly and J. Anderson.



THE BLAVIER METHOD OF LOCALIZING FAULTS.

There are, however, cases when, if possible, it is desirable to localize a fault by measurements from one end only, and to be enabled to do this with as much accuracy as possible, it occurred to Mr. Jordan, one of the acting electricians of the Great Northern Telegraph Company in the Far East, that the following modification of the ordinary Blavier method might be made, in order to remove some of its disadvantages as mentioned above.

The diagram shows Mr. Jordan's arrangement. Box I. is an ordinary Wheatstone bridge with resistance coils, and Box II. an ordinary resistance box from 1 to 10,000 ohms. G is a Thomson's reflecting galvanometer. A is a commutator, and to the same and the bridge is connected a cable, in which there is a fault, Z, with the lengths, x and z, on either side thereof.

The *modus operandi* is as follows: First, the resistance is measured in the usual manner with the other end of the cable earthed and with no plug in A, and balance is obtained by unplugging a resistance, R₂, in Box I.; then

$$R_2 = x + \frac{y z}{y + z}.$$

The moment it is observed that the cable is freed at the other end, a plug is inserted in A, R₂ is left unaltered and the resistance in Box II. is adjusted until the spot of light again covers

zero; then $\frac{R_3(x+y)}{R_3+x+y} = R_2$, from which

$$x + y = \frac{R_3 R_2}{R_3 - R_2}.$$

We know that $x + y = R$, and thus we have

the equations requisite, and arrive at the following expression:

$$x = R_2 \left(1 - \sqrt{\frac{R - R_2}{R_3 - R_2}} \right).$$

From this it is manifest that when the cable is insulated the current is shunted by the resistance, R₃, in the same way as z is a shunt when the cable is earthed, and the result is that the fault in the two cases is acted upon by currents of more equal strength than in the ordinary Blavier test; and further, that it is possible to take the tests so quickly and nearly instantaneously after each other, by having adjusted the resistances, R₂ and R₃, in accordance with the two conditions, that the resistance of the fault may be assumed to remain approximately constant during both measurements.

ELECTRIC FOG SIGNALS.—The *Herald* of this city describes a fog signaling apparatus lately invented in London, which will be of great value in the saving of life and property at sea. The invention calls into use electricity, which admits of the signals being automatically worked and at the same time records every signal as it is given on a band of graduated paper. The apparatus consists of a single switch which is placed on the vessel's bridge so that the signaling can be controlled by the officer on watch. When it is desired to blow the signal whistle or begin the automatic signaling, what ever its nature may be, the lever is turned to the "under way" notch if the vessel be moving, and the electric current at once begins working the valve of the steam whistle at regular intervals, conforming to what the law specifies. Should the vessel be at anchor the switch is turned to "at anchor," and the bell is rung in the same way. The register consists of the band of paper properly subdivided and moved along by clock-work. A traveling pointer, actuated by an electro-magnet, pricks the paper at every sound of the bell or whistle. The signaling can also be made at will entirely independent of automatic mechanism by simply pressing a button which closes the circuit leading to the bell or whistle.

Perhaps no more significant evidence of the onward march of civilization could be afforded than the lighting by electricity of the palace of the Guikwar of Baroda in India, and that, too, on a scale of unstinting splendor. The interior is lit with 215 16 candle power incandescent lights. The large hall is illuminated with two large 12-light electroliers, made in bronze and lacquered work, while the light is softened and diffused by dioptric shades. Single lights are also pendent from the ends of the columns of the gallery. In the numerous rooms are three and four light electroliers, made in a variety of designs to suit the surroundings.

It is noted in Berlin that Mr. Weems of Baltimore has reproduced Dr. Werner Siemens's idea of long ago of an electric letter post. Dr. Siemens proposed that this form of transit of letters should replace the pneumatic tube system now in use in Berlin and Paris, the letters being conveyed on small electrical cars through a tube at a very high rate of speed.

Shelford Bidwell has published a preliminary notice of certain experiments made by him, which apparently show that a piece of iron can be slightly magnetized by allowing a ray of light to fall upon it. Mr. Bidwell does not consider the results entirely free from suspicion, but, if further results confirm the experiment, it is of the highest importance, and will go far to prove that light is an electro-magnetic disturbance—a theory which many other facts apparently tend to confirm.

The case of the Bell Telephone Company against the Arkansas Telephone Company was dismissed at Fort Smith, Ark., recently. The plaintiff is to pay costs.

DENVER'S ELECTRIC LIGHTING.

For a city of its size Denver has, without doubt, the finest plants of electric light machinery in the country, although the light furnished is not always faultless. The Denver Consolidated Electric Company has a capital stock of \$1,000,000, and have the largest central station in the country. From the plants of this company are furnished the light for all city purposes, beside the domestic and commercial lighting. There are 216 arc and 930 incandescent lamps now in actual use by the city. There are eight towers, constructed of cast-iron, with six lamps of 3,000-candle power each. These towers are seventy-five feet in height. The incandescent lamps on the corners of all streets are supposed to have a twenty-candle power. In the last year the company's works at Twenty-first and Wewatta streets have been enlarged to twice the original size, while another large stack has been erected. The Brush system is employed for arc lighting entirely, while the Edison municipal system is employed for street lighting. The Westinghouse alternating incandescent is employed for commercial and domestic uses.

The arc light room now has a capacity of 1,000 lights of 2,000-candle power each. Of this number 900 are in use. The city lights run on what is known as the moonlight schedule. On Fifteenth, Sixteenth and Seventeenth streets are located 170 arc lights of 2,000-candle power each, hung at the intersections of the streets. The Consolidated Company keeps a large force of men, known as "trouble hunters," constantly looking up breaks and other accidents.

The Denver Electric Illuminating Company has been in operation about fourteen months, during which time its works, located at Sixth and Lawrence streets, have been more than doubled to meet the enormous demands for light. The company's present building is 171 by 135 feet and two stories high. Its plant consists of nine arc dynamos, two incandescent dynamos and two motor or power dynamos. The Thomson-Houston system is employed throughout.

Over 300 arc lights are in operation at present, and over 800 incandescent lamps have been placed since the installment of the first incandescent dynamo four weeks ago. It has been almost impossible with an extra force of men employed to meet the demand. Over \$200,000 was expended last year in permanent improvements and extension of service. This company's lines are now extended over all of East Denver. A contract has been let recently, by the terms of which this company will furnish the town of Highlands with street light throughout its entire limits.

EDISON LAMPS,
1/2 TO 36 CANDLE POWER.
2 1/2 TO 40 VOLTS.

FOR BATTERY OR DYNAMO.

These Lamps can be used in Series on Dynamo Circuits for all kinds of Decorations and Displays.

SEND FOR CATALOGUE OF LOW VOLT LAMPS.

EDISON LAMP CO., Harrison, N. J.

ZINC BATTERY PLATES.

Especial attention given to forms and odd shapes, either from description or sample. Prices upon application.

Prompt attention guaranteed.

E. L. CHURCHILL, HANSON, MASS.

THE FIFTH TELEGRAPH CITY.—Kansas City stands fifth among cities in the amount of Western Union telegraph business handled and seventh in amount of receipts. During the year the receipts have increased about \$13,000, which indicates a slight increase of business. Over 6¼ million messages have been handled, over 1¼ million being city messages, received and sent, and the other 5 million being relays and press special dispatches. To transact this business there are 154 operators, 50 of whom are women, 39 messengers, 23 clerks and a manager. This great volume of business comes into the office over 120 separate wires, and 54 loops extending to city offices aided in facilitating it. Kansas City is one of the greatest "relay" offices in the country. More than three times as many messages are relayed here as are received and sent for the city proper. There are 23 branch offices in the city. In not another year since its establishment in this city has the Postal Telegraph done as much in extending its lines westward as in 1889. Lawrence, Kan., is now connected with this city by this line and Topeka will be in a few days. Denver will be connected by April 1. With this connection by northwestern wires the company will reach from the Atlantic to the Pacific. At Topeka it gets a Texas connection to the Gulf. From the main line the company intends to reach all towns of importance west of this point. The company reports an increase of 25 per cent. over last year's business. Fifteen more operators are employed in the main office than a year ago.

KANSAS CITY POSTAL NOTES.—No changes since last letter. The force at present is as follows: F. K. Holtzinger, mgr.; A. B. Richards, chief opr.; A. D. Fairo, asst. chief opr.; C. H. Shell, night chief; B. C. Elder, traffic chief; Ben Rommell and J. S. Cregan, day report; H. S. Coe, night report; W. D. Hausam relief opr. for night report. The other "artists" are, A. Jackson, Harry Morlan, H. E. Matson, H. R. McMicken, Chas. E. Mallanee, J. H. Brennan, Robert Baker, W. B. Craddock, H. D. McCauley, Chas. Falk, Mrs. L. D. McKillop, cashr.; Dolly Crain, receiving clerk; Harry Taylor, delivery clerk; W. C. Marche, night delivery clerk; Kate Crain, asst. bookkeeper. At the branch offices we find, H. C. Hill, Union depot; T. L. Marshall, Board of Trade; W. E. Page, Swift & Co., private opr.; Louis Lesem, "D" office; G. W. Knapp, stock yards; Miss Hamilton and Miss Needham at Hotel Midland. Business has been good for the past two months.

CLEVELAND NOTES.—On Christmas eve the night operators of Cleveland office surprised their esteemed and genial Night Assistant Chief Operator, Mr. Isaac Morris, by presenting him with a beautiful onyx mantel clock, suitably inscribed, as a token of the high regard in which he is held by his associates. The affair was a well-kept secret and proved a genuine surprise to the recipient. Chief Operator, O. A. Gurley, was delegated to make the presentation speech, and in a very neat manner expressed the sentiments of the donors. Mr. Morris was visibly affected, but gathered himself together and responded in a few and well chosen remarks. Congratulatory telegrams were received from Philadelphia, Chicago, Cincinnati, New York and other points, and the event passed over very pleasantly.

Mr. Frank C. Mason, the well known and popular superintendent of Police Telegraphs of Brooklyn, N. Y., has donned the uniform of captain of police, and his operators and linemen have been instructed to don the blue coats, trousers and brass buttons. We have not discovered that Mr. Mason carries a club concealed in his sleeve.

Mr. S. B. Lambdin, of 195 has made quite a snug sum of money lately by a series of fortunate movements, which will "keep the wolf from the door" for years to come.

T. M. B. ASSOCIATION.—Assessment 237 has been levied to meet the claims arising from the deaths of M. J. Mangan, at Binghamton, N. Y., and James H. Honea, at Gladewater, Tex.

LONG WHEATSTONE CIRCUIT.—Probably the longest Wheatstone circuit in the world is that between Chicago and San Francisco, a distance of about 2,500 miles. There are repeaters at Omaha, Cheyenne, Ogden and Reno. This circuit carries all the overland business, including Associated Press matter. The repeater at Ogden enables that office to secure a drop copy, which besides being used at that point, is sent per Morse circuits to Cheyenne, Denver, Salt Lake City, Virginia, Sacramento, Butte, Anaconda, Helena, Missoula, Spokane Falls and Portland, Oregon. In addition to this, Chicago and San Francisco transmit their Ogden business on the "mill" and Ogden in turn sends about 400 messages a day East and West. When Chicago is sending to Ogden Ogden is sending to San Francisco and *vice versa*.

DIED.

Charles E. Chesebro, a well known telegrapher, died suddenly, January 13th, at his home in Syracuse, N. Y. Mr. Chesebro was born in Ithaca, this State, thirty-nine years ago. While yet in his youth he went to Auburn, where he began his career as a telegrapher. In 1876 he married Miss Helen F. Iveson of that place, who survives him. Afterwards Mr. Chesebro worked at Oswego, Albany and Buffalo, coming from the latter place to Syracuse. For the past ten years he has copied the night Associated Press report in this city. He had been ailing for a fortnight, but remained at his work until nine o'clock on the night of January 11th. Pleurisy was the cause of death. The remains were taken to Auburn for interment.

Mr. Edward R. May, manager of the Postal Telegraph Company's office at New London, Conn., died at his home early last week. The cause of death was typhoid-pneumonia. He was highly esteemed in the community, and was a member of various societies, benevolent and public. His funeral took place on the 10th inst., and was attended by a large concourse of friends.

Thomas J. Wiseman, aged twenty eight years, of the Western Union force, at the Consolidated Exchange, died January 4th at his home, 72 Navy street, Brooklyn, of consumption. His funeral took place January 6th, and his remains were interred in Flatbush cemetery. He was a member of the Aid Society. Mr. J. C. Ashby represented the telegraphers at the funeral.

Thomas Egan, a telegraph operator, formerly employed by the Postal Telegraph Company, at Pittsburgh, Pa., died at his home in Parkersburg, W. Va., January 1st, of consumption. He was an old-time operator and was well and favorably known in telegraphic circles throughout the country.

Milton C. Dodd, manager supply department and purchasing agent Metropolitan Tel. & Tel. Co., died December 1, 1889 at Newark, N. J., aged 32 years; insured in the T. M. B. A.

A. W. Pearkes, an old-time operator, for many years with the Standard Oil Co., N. Y., died December 27th, aged 56 years; insured in the T. M. B. A.

The wife of Mr. C. L. Chase, chief operator of the Commercial News Department, in the Western Union Building, died suddenly last week.

PRIZE STORIES.—Owing to the press of other matter, two or three prize stories have been crowded out of this issue. They will appear in our next edition.

THE ELECTRIC CLUB OF BROOKLYN.—This club gave its final entertainment and reception of the year at their rooms in Johnston Building, Friday, December 20th. Notwithstanding the inclemency of the weather, a host of friends responded to the club's invitations and enjoyed a pleasant evening. The following ladies and gentlemen kindly entertained the guests with songs, music, etc.: Miss Bulger, the Misses Lupton, Miss Bennett, Miss Perdon, Miss Leahy, Mr. Phalen and Mr. Hart. Among those present were Messrs. Edward Martin and lady, W. Rogers and Miss Henry, J. McCausland and wife, Lockner and lady, J. Dempsey and lady, F. Marshall and lady, Tone and Miss Tuthill, Sheffer and Miss McIlhenny, J. Slavenska and Miss Cooper, J. I. Shaughnessy and Miss K. Begley, F. Lu kow and Miss Polhemus, A. E. Cassidy and Miss S. Perdon, Hart and Miss V. Ohland, Fellerman and Miss N. Ohland, E. Connelly and lady, J. Nolan and Miss L. Lupton, J. Tierney and Miss K. Bennett, Andrew Tierney and wife, Rob. Doyle and Miss W. Bulger, Chas. Doyle and Miss M. Leahy, Chas. A. Kilfoyle and sister, M. J. Phelan and Miss M. Lupton, J. Blaney and Miss Harvey, F. Torris and Miss McLean, Fred. Paine and wife, Geo. Weideman and wife, W. H. Pearson and wife, and Harry Dobson and wife.

THE T. M. B. A.—The enterprising secretary of the Telegraphers' Mutual Benefit Association, Mr. Thos. E. Fleming, deserves much credit for the deep interest he takes in the welfare of its members. He has just issued a very neat little pamphlet giving a brief history of the organization and explaining very lucidly the advantages of being a member of this, the oldest mutual benefit association in the United States.

BLACKLISTED OPERATOR.—Edward L. Randall, an operator on the Rock Island road, has sued that company for \$25,000 damages. He was "blacklisted" by Superintendent Swift for organizing a branch of the Order of Railway Telegraphers. District Sup't F. H. Tubbs, of the Western Union Telegraph Company at Chicago, was directed by the court to answer certain questions bearing on the subject.

RAILROAD TELEGRAPHERS AID SOCIETY.—The fourth annual session of this society was held in Cleveland, on December 10. The reports of the officers show very gratifying results from the year's work. The object of the society is a laudable one, and should be heartily supported by its members. The financial reports show a good-sized balance in the treasury, which speaks well for the management of the affairs of the society.

FRAUDULENT COLLECTORS.—Charles D. Kellogg, general secretary Charity Organization Society, in this city, warns the public against collections for fictitious charities. These fraudulent solicitors have added a new department to their enterprise which they allege is composed of telegraph operators.

\$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.

FIRST ANNUAL BALL OF THE C. P. R. TELEGRAPHERS.

One of the most enjoyable social events of the season was the first annual ball of the C. P. R. telegraphers in Toronto, on the 10th inst. In place of the monotonous tick-a-tick of the telegraph instrument there was the pit-a-pat of dainty feet as they glided over the smooth floor of the big ball room in the gay dance, making music for the tired ear of the operator, whose occupation is so uniformly dull as to be beyond the endurance of less philosophical people. A few minutes after ten the orchestra played the opening march and the dancing continued until twelve, when supper was announced. At the conclusion of this most enjoyable feature of the evening there was more dancing.

Among those present were the Mayor and Mrs. Clarke, Supt. Pingle, L. B. McFarlane, Montreal; S. J. Murphy, and the Misses Murphy, Miss Brophy, of New York; Mr. S. J. McGann and the Misses McGann, Miss McGrand, Mr. Aymore, D. O'Halloran and Miss O'Halloran, Mr. M. J. Knox, Miss E. Stafford and Miss Walsh, the Misses Robson, Mr. M. J. Cummings and Miss Glenn, Mr. and Mrs. Natrel, Mr. and Mrs. Geo. Carlisle and Miss F. Carlisle, Mr. and Mrs. J. B. Rogers, Mr. and Mrs. Geo. Spencer, Mr. and Mrs. D. Urquhart, Mr. and Mrs. J. Madden, Mr. and Mrs. C. E. McManus, Mr. J. Armstrong and Miss L. Patterson, E. McSweeney and Miss Jordan, Miss E. Tangrey, Mr. E. H. Delbarre, Mr. W. J. Ryan, Miss Stewart Gourlay, Mr. C. Jelly and Miss Dee, the Misses Birchall, Mr. E. R. Blow and L. Blow, of Whitby; Mr. and Mrs. T. W. Barber, Miss Harper, Miss Ida Watson, of Port Hope; Mr. Mitchell and Miss K. Raynor, A. Clifford, Mr. F. McCutcheon and Miss Winfield, Mr. Geo. Stewart and Miss Bella Wynn, Mr. H. Rowland and Miss Grace Wynn, Miss N. McGolpin, Mr. McKnight and Miss Gardiner, Mr. H. Shaw, Mr. C. Shaw and Miss Maggie Wynn, Mrs. Barnes, of San Francisco; Mr. J. Latremouille and Miss Latremouille, Miss Colby, Mr. W. J. Anderson, Mr. C. N. Smith, Mr. J. Collie, Mr. H. Shambrook, Mr. H. J. Lillie, Mr. N. McCallum, Mr. G. Forbes, Mr. Elliott, Mr. F. C. Robertson, Mr. G. Lamontre, Mr. Rosebrough, Mr. F. A. Sinclair, Mr. Frank McCutcheon, Miss Winfield, the Misses McCutcheon and Mr. R. Tilt and Miss McFarlane.

TELEGRAPHERS' RECEPTION.—The Philadelphia Telegraphers' Social held a reception at McLaughlin's Academy on Tuesday evening, January 14. The officers of the Social are: President, M. McDonald; Vice President, C. E. S. Focht; Recording Secretary, G. J. Smith; Financial Secretary, J. W. Miller; Treasurer, C. H. Sterner. The Committee on Reception is composed of the above officers and the following members: Jos. Locuson, C. C. Denny, A. D. Brenner, John W. Cowley, G. Wilkinson, J. J. Meakin, J. J. Dougherty and C. H. McDonald.

NOTICE.—J. D. Cameron, formerly of Napanee, Ontario, telegraph operator, will confer a favor by communicating immediately with Kate McNeill. The McNeill estate cannot be closed without hearing from you.

We have just received from James Vick, Rochester, N. Y., his Floral Guide for 1890. It is a pamphlet eight by ten inches in size, and is the most complete and convenient we have ever had the pleasure of seeing. It contains over one hundred pages, and is not only as its name implies, a Floral Guide but is devoted to vegetables as well, and includes as full a list and description of flowers and all kinds of fruits as could be brought within the compass of a book of this size.

—"There must be a fire somewhere," said Hobbs. "Why, I didn't hear the bells," said Nobbs. "Nor I," replied Hobbs, "but I just saw a messenger boy running."

PHILADELPHIA POSTAL NOTES.—The Christmas holidays brought the usual good cheer, happiness, and customary presentations. Superintendent C. G. Adams, was made the recipient of a handsome double-chain of platinum and gold, with a charm pendant of like metals, as the gift of the branch office managers. Manager Stanger, was presented with a revolving office chair, in behalf of his employees. Mr. Stanger's office, is undergoing extensive alterations, and when finished will be a credit to the company. "La Grippe" has made the acquaintance of nearly every employee, with more or less severity. Mr. Robert Preston, the popular young manager in the hide and leather district, has had a very busy and profitable season during the holidays. Mr. Henry G. Butcher, manager of the Commercial Exchange office, is a zealous worker in behalf of the temperance cause. Richard C. Toft, from the P. R. R., is the latest arrival since last letter. A D. T. NOTES.—This company has had a regular avalanche of packages, cards, etc., incidental to the holiday influx of trade. Every available person was pressed into service. Sympathy is extended to cashier Benjamin F. Seiser, and family, who mourn the loss of a wife and mother.

W. U. NOTES.—A number of main-office operators had a pleasant New Year surprise in the form of an increase in salary. Manager J. D. Eves, of the Stock Exchange and his wife have both been very low with typhoid fever, for over a month, and Superintendent of Construction David P. Emminger, is lying at his home at the point of death, with pneumonia and a complication of diseases. "La Grippe" seized a number of employees, among whom were the Misses Cook, Murphy, McLaughlin, Cooper, Connors, Hussey, Henry, Wallace and Messrs. Layton, Rea, Buckwell and McKeever. Miss E. T. Murray, has been added to the day force. Mr. W. W. Donnelly, is acting manager at Stock Exchange, during Mr. Eves' absence. Mr. Benjamin Roos, who died in Savannah, on Dec. 31st, of consumption, was a well-known ex-operator in this city, where he had many friends. On Christmas, the employees at "Cu" office presented their chief, Mr. George Ryley, with a handsome umbrella. Miss Annie Fee, has been transferred from the enveloping department, to assist "Murphy," the author of so many "G. B. A." service messages. The change in the AGE meets with general approval here. Some time during this year the building now occupied as the main office will be torn down, to make room for a larger building and consequently the Western Union will have to move.

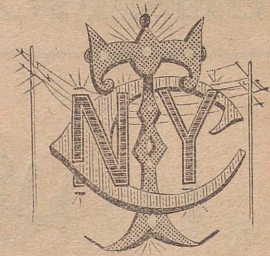
WINNIPEG NOTES.—There has been a lot of sickness among the boys here lately, but hope to have them all convalescent soon. Jas. D. McLeod one of our old operators who died with typhoid fever recently, was formerly with the G. N. W. here. Later he was agent for the M. and N. W. Ry., at Neepawa, Man., but about a year ago he resigned to accept the chief clerkship in the city office of the C. P. R. here. He was confined to his bed only a week when death resulted. He left a widow and two children. He was well liked and will be greatly missed by a large number of friends.

AN EXTRAORDINARY OFFER.—We have decided to make a special offer to operators who would like to receive a copy of both the electrical and telegraph editions of THE ELECTRIC AGE. The subscription price of the Electrical edition, which is weekly, is \$3 per year, and of the Telegraph edition, (semi-monthly) \$1.50. We will send both to any one telegraph subscriber for \$3 per year. This is an extraordinary offer and should be availed of by all operators. By taking both papers operators will not only be kept informed of what is going on within their own sphere, but also outside of it. By reading the Electrical edition they will be educating themselves in the various other branches of electrical industry, and thus be better fitted to fill positions in these departments, which are expanding so rapidly as to severely tax the supply of help.

ERIE RAILWAY NOTES.—Born to Mr. and Mrs. Scuyler C. Pew, of Ramapo, a boy. Mat Thompson has been subbing at "Hu." Fred Cramer has just returned from a visit to his parents in Pennsylvania. Garry Remsen did the subbing. He is acting in the same capacity for Mr. Garvey, who has also gone West. W. J. McAuliffe started for Kingston, thence to Port Jervis to spend the holidays. Charlie Shoudy takes his place at Ridgewood. There was a considerable number of the boys disappointed on account of not having made application to be relieved on Christmas day before the successful ones had been made happy by our congenial chief, Mr. Boyd. Jno. Winter is working at "Q X" nights. At Goshen is Mr. Cox, manager, assisted by J. Connolly and Chas. Rixton. At Middletown: J. Wright, days; Jack Gillen, nights. At "O V," J. C. Downs and Joe Fields. At "G R," P. Meehan and Jas. Seymour. M. Riley is at Turner's, nights; George Wilton at "M S," nights. Jack Gillen is working for Mr. Wright, at Middletown, who is taking a vacation.

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CATARRHAL DEAFNESS—HAY FEVER.

A NEW HOME TREATMENT.

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result of this discovery is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks.

N. B.—This treatment is not a snuff or an ointment; both have been discarded by reputable physicians as injurious. A pamphlet explaining this new treatment is sent free on receipt of stamp to pay postage, by A. H. Dixon & Son, 337 and 339 West King St., Toronto, Canada.—*Christian Advocate.*

Sufferers from Catarrhal troubles should carefully read the above.

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(4) Please state the number of relays included in each circuit?

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(7) Please state number and kind of cells at present in use on each line?

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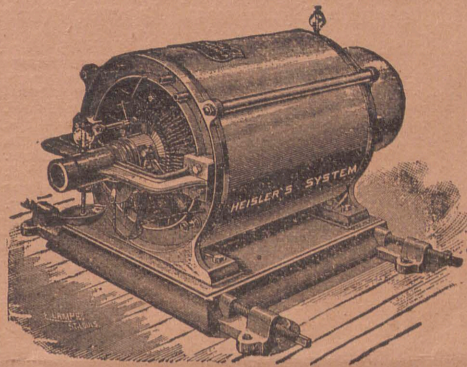
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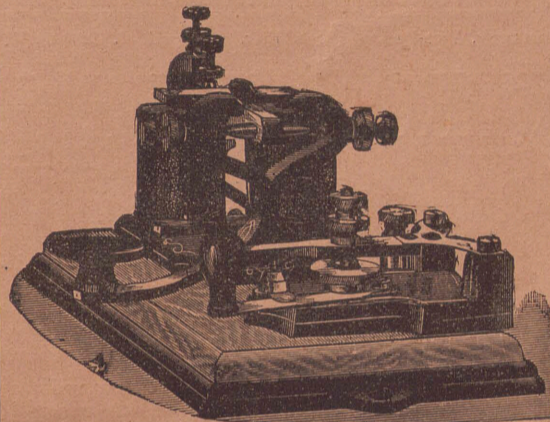
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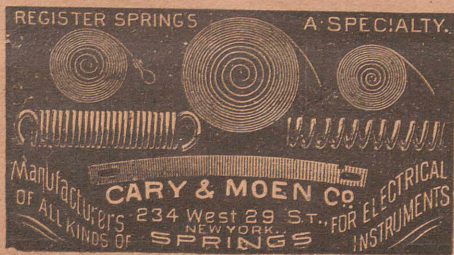
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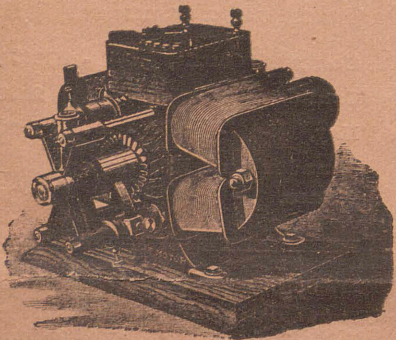
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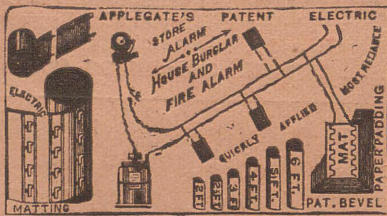
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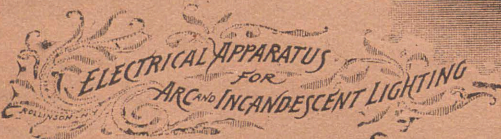


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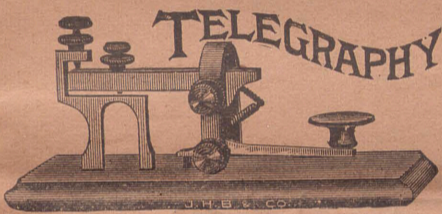
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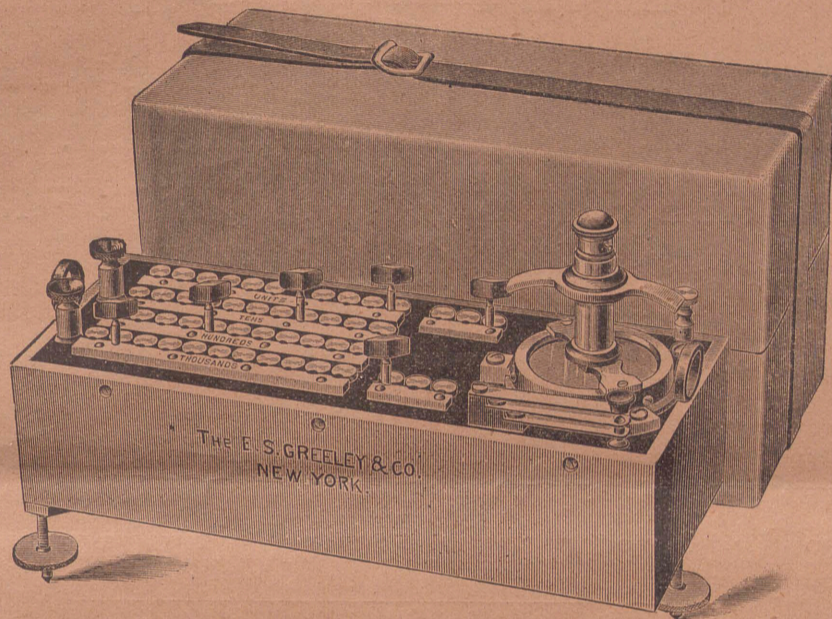
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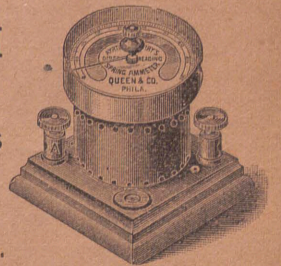
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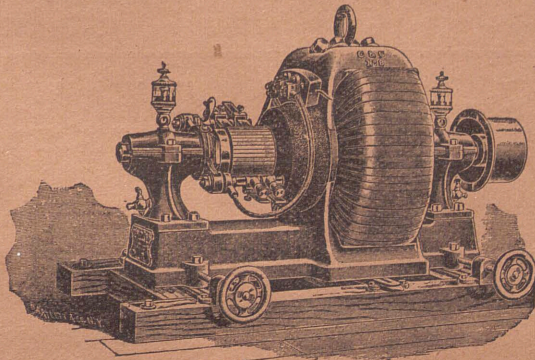
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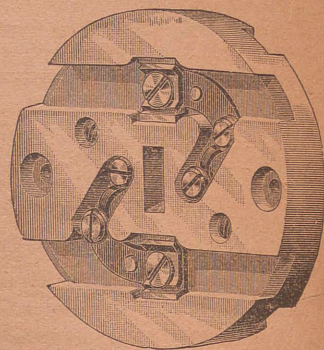
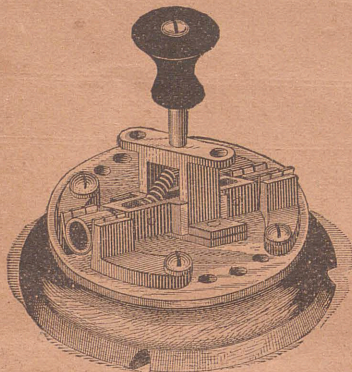
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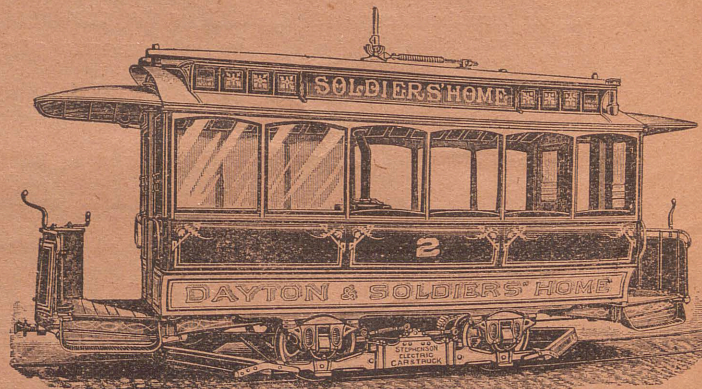
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THE SENDING TOURNAMENT.

The announcement in the last number of the Age that arrangements were being made with a view of holding a fast sending tournament in this city early this spring created considerable comment of a most encouraging nature. Conversation on the subject with a large number of the boys demonstrates the fact that the idea is rapidly growing in popularity, and from present indications the list of competitors will be a longer one than has ever before been seen in a contest of a similar kind in this country.

"I am not prepared to definitely announce the value of prizes," said Mr. Catlin to your correspondent a few days ago, "but you may say that I have received prompt and generous responses from J. H. Bunnell & Co.; The E. S. Greeley & Co.; *The Electrical World*; the United Press and Associated Press, and the ELECTRIC

AGE, which guarantee the unqualified success of the affair. Tickets will be issued shortly, and accompanying each one will be a copy of the matter used in the last contest with the record of senders.

The opinion is generally expressed that the matter used in the last trial should be used in the coming one as it is likely a prize will be offered for breaking the record, and this question could not be decided on a narrow margin if the matter used was different." April 8th is the date decided upon for holding the tournament, and all those who contemplate entering should be up and doing.

It is also possible that Mr. Chauncey M. Depew may be asked to furnish the matter for transmission.

A gentleman in Chicago writes as follows:

"Fred Catlin's Fast-Sending Tournament proposition is attracting attention. We don't know how much in other circles, but enough of it right here in Chicago, to set the heads of all the ambitious youngsters agog.

"Mr. Catlin's proposition is well enough, but where is the tournament to take place? Most decidedly in the city where the World's Fair is held. And another thing. Why should the preliminary contests of the craft of the United States occur almost two years previous to the proposed International Tournament. Should successful competitors be decided upon at the former, it is possible that just these very victors may have lost their grip, or even may be dead, when the decisive moment arrives. Would it not be wise, to propose this idea, say about this time, 1892?"

AN ANSWER.—A young correspondent asks the meaning of the expression "salted" as applied to operators. From the tone of his inquiry we infer that he has been subjected to the operation, but is so inexperienced that he does not know whether it is a compliment or otherwise. We will try and enlighten our young friend. Anything to be "salted" must first be "fresh." One of Webster's definitions of "fresh" is, "a raw, green or untried state." Our young friend evidently fulfilled these conditions, and the man at the other end of the wire perceiving this, proceeded to at once "salt" him. One of the properties of salt is to preserve from decay. The gentleman, who applied the "salt," in this case, was probably moved to do so by his good feeling towards his fellow men. He evidently wished to preserve you from decay, so that the next generation would derive some benefit from your superior knowledge of telegraphy.

A PECULIAR LAWSUIT.—A very peculiar damage suit against the Western Union Telegraph Company is now on trial in the Court of Common Pleas in Findlay, Ohio. The plaintiff, John Allen, asks \$50,000 damages growing out of the following circumstances: On March 12, 1889, Allen sent a telegram to his wife in Groveland, N. Y., telling her to leave for Findlay on the 14th, and he would meet her in Fremont. The telegraph operator changed the telegram in transmitting and made it read, "Start to-morrow," which was the 13th. This Mrs. Allen did, but on reaching Fremont, as a natural sequence, failed to meet her husband. She came on to Findlay, arriving there on a midnight train. The whole affair so worked upon her that she became ill. Her physicians say she will never regain her health.

WRITING-TELEGRAPH COMPANY.—The Writing-Telegraph Company of Baltimore, Md., has been incorporated by Edwin F. Abell, B. F. Deford, Michael Jenkins, Richard Cromwell, James D. Mason and Nathan Steuart. The capital stock is \$100,000. The corporation is authorized to own and work telegraph lines in Maryland and transact a general telegraph business, to use inventions under patent for writing-telegraphic instruments, and transact any business in which electricity may be applied to useful purposes. The incorporators of this company represent some of the wealthiest and leading business men of Baltimore, whose estimated wealth is over \$12,000,000.

THE PHILADELPHIA AID SOCIETY.

At the second annual meeting of the Philadelphia Aid Society the following were elected as officers for the ensuing year: President, John W. Benckert; Vice-President, W. H. Given; Treasurer, H. W. Hetzel; Recording Secretary, W. E. Vanarsdal; Financial Secretary, A. W. Ford; Executive Committee—Misses Connor, Merrick; Messrs. Buckwell, Friend, Weir and Janney. The reports for 1889 showed: Number members, 153. Number members sick, 19. Number weeks sickness, 68 3-7. Amount sick benefits paid, \$479.00.

Balance from last annual meeting . . . \$645 82
Interest allowed on deposit . . . 14 13
Received from Financial Secretary . . . 839 00

\$1,498 95

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Benefits 479 00

\$533 55

Balance in bank \$924 10
Cash on hand 41 30

965 40

\$1,498 95

Total membership 226
Died, resigned and suspended . . . 78
Delinquent 18

96

In good standing 130

ILLUSTRATIONS AND DESCRIPTIONS OF TELEGRAPHIC APPARATUS.—The second edition of Terry and Finn's book giving illustrations and descriptions of telegraphic apparatus is meeting with a large sale. The second edition is limited in number of copies, and it will soon be exhausted. The scope of the work is best described in the preface, which reads as follows: "In publishing this work the authors have sought to bring within the reach of all Telegraphers a book illustrative and descriptive of the principal telegraph apparatus in practical use upon the lines of the different telegraph companies at the present day. * * * * * An additional and it is hoped valuable feature of the book will be found in the articles explanatory of the elementary principles of ordinary circuit testing and of Wheatstone Bridge measurements." The section devoted to the various methods of testing lines, etc., is a very valuable feature of the book, and any operator with a little mechanical ingenuity might construct apparatus to enable him to master the science with great facility. The special features of the second edition are the descriptions and illustrations of the methods of F. W. Jones, Gerritt Smith, and Moffatt and Blakeney of increasing the efficiency of the quadruplex. The price of the book, which is very tastefully gotten up, is \$1.50. For sale by THE ELECTRIC AGE PUBLISHING CO., 5 Dey street, New York.

DEFENDING OPERATORS' CHARACTER.—A writer in the *New York World* has this to say of the probrity of operators in general: Now the National League is hurling invectives at the telegraph operators. By an accident several of its telegrams have fallen into the hands of Players' League officials, and the latter were thereby enabled to checkmate its contemplated moves. The old League, with its usual sagacity, sees no way that the contents of these messages could have been disclosed except through the treachery of some operators. The stories I hear about the telegrams do not connect any operator or any telegraph office with the disclosure, and I do not believe there is the slightest foundation for the National League's charge. There is no class of professional men in the country who guard the secrets intrusted to their care with greater fidelity than the telegraph operators. In a long and intimate association with hundreds of them I have yet to learn of a case where such a trust has ever been betrayed. The magnates are barking up the wrong tree.

CAN ELECTRIC LIGHT CURRENTS BE MADE SAFE?

WHAT PROMINENT ELECTRICIANS HAVE TO SAY ON THE SUBJECT.

In reply to our circular on the above-named subject, which we sent to prominent electricians throughout the country some time ago, and many of whose replies have been published in previous issues, we have received the following:

MR. C. S. VAN NUIS,

ELECTRICAL EXPERT, NEW YORK.

1.—Can over-head electric light lines be rendered reliably safe at all times? If so, how?

Answer. Yes, by using good insulation, careful construction and rigid inspection at short intervals.

2.—In your opinion, is there any reliable and durable method of insulation which can be applied to over-head electric light wires, and which will absolutely prevent any escape of current, particularly in wet weather?

Answer. No; but the escape can be kept within safe limits by frequent insulation tests and the necessary repairs.

3.—Is there, in your opinion, any reliable method of laying electric light wires underground?

Answer. Yes; in tunnels.

4.—In your opinion, would the existing dangers be entirely overcome by placing the wires underground?

Answer. No. Dangers will exist as long as careless methods are employed on high tension currents, either aerial or underground.

5.—How, in your opinion, can the danger to life and property, so frequently exemplified of late, be completely overcome?

Answer. To completely overcome danger to life will be to confine the E. M. F. to a safe limit. Danger to property can be overcome by suspending all wires in air space, or non-combustible insulators, or encasing them in insulating tubes, which are water and fire-proof, and the proper use of safety fuses to guard against abnormal currents.

6.—What means should be adopted to prevent fire in case of derangement on electric light circuits running into buildings?

Answer. Answer to fifth question covers this.

LONG DISTANCE TELEPHONE IN SOUTH AMERICA.—The trunk telephone line connecting Buenos Ayres and Montevideo was opened recently with great ceremony. The line is carried on posts along either side of the River Plate from Buenos Ayres and Montevideo, respectively, to the points where the river is crossed. The connection here is established by means of submarine cables, which cross the river at a breadth of 28 miles. In the vicinity of Montevideo the bronze wire spans a distance of 460 yards across the river Santa Lucia, by means of poles 108 feet in height. The charges for the use of the telephone are worthy of notice. During the busiest part of the day they are as follows: For five minutes' use, \$5; for five to ten minutes' use, \$12.50; for ten to fifteen minutes' use, \$25. The line has so far given satisfaction both as regards articulation and loudness.

OPEN CIRCUIT TRANSFORMERS.—Mr. Joseph Wetzler at the last meeting of the New York Electrical Society, among other things, referred to the work of Mr. J. Swinburne on open circuit transformers. The "hedge-hog" pattern of open circuit transformer is claimed to be more efficient than the closed circuit type. In the designing of this new style of transformer Mr. Swinburne sought to overcome certain difficulties in the closed circuit pattern.

HOW SHALL WE MAKE OUR WIRES SAFE?

BY W. H. MARKLAND, ELECTRICIAN OF THE PENNSYLVANIA RAILROAD COMPANY.

I have read with considerable interest the various answers to the questions put out by THE ELECTRIC AGE on "can electric light wires be made safe?" I think they should be followed up by the question, "How shall electric wires be made safe?" Of course for new work the answer is, use the best insulation. There is no excuse at the present day for using underwriters' wire, as wire of a fair insulation can be had for about the same money.

There are hundreds of miles of underwriters' wire now in use. The managers of electric light stations would say, if you told them to take their underwriters' wire down, that they have never had any serious trouble from the wire now up, and that they bought the underwriters' wire in good faith, believing it to be the best for the purpose. Why should they go to the additional expense of putting up new wire, and what real assurance have they that the new wire they get may not become as bad in time as underwriters' now is? If they go to wire maker A, he says he makes the only good wire. Wire maker B says he makes the only good wire, and so on. The only thing left is to go to your neighbor and ask him what he uses, and test the insulation resistance of the wire, if the proper apparatus is handy, which is not always the case in a central station. A simple test of insulation is not conclusive proof that a wire will stand when exposed to sun, heat, cold, weather changes, etc.

I have had grounds occur when one of the best known insulations was used, and have lines run with underwriters' wire that have never given trouble.

I think the great question now is "How shall the present wires be made safe?" I will mention a few suggestions from my experience, hoping they may lead to others from parties who have had experience in other places.

Underwriters' wire will eventually wear or fray out; it then could and should be replaced with better wire. This could be done piece or loop at a time, so the expense may not be great at any one time.

When a wire is taken down to be replaced by new, I consider it a good plan to put up new insulators also. The old insulators can be cleaned off when dirty and put in use again if whole.

I always make it a point to go over all my lines at least twice a month and have my men go over them very often. If any point looks as though it might give trouble, I have it repaired as soon as possible. I do not consider it good policy to say that because a wire has been up two or three years it is all right for ever.

I believe in testing as often as possible, say every hour while lamps are burning. A line will often test clear during the day and develop trouble while lights are burning and clear again when lights go off. If I know there has been trouble I can have it looked up and remedied, possibly, before any damage is done.

I believe in dividing lines into as many loops as possible, where it can readily be done, as it is much easier to hunt trouble when you know it is on a loop with 15 lamps than where you have to go the length of three such loops all in one with 45 lamps.

If some person puts up a telegraph line over my high potential wire, I put an insulated guard wire over my wire, if possible; so in case of the telegraph wire falling it may not fall on the electric light wire and do damage. I would rather spend a little money for protection than burn the other parties' machinery up. I had a case lately where a telegraph wire was put up over an arc wire. I had the arc wire lowered and an iron guard wire put on the very

insulators where the arc wire was. Not two months later the telegraph wire sagged so it came in contact with the guard wire. If the arc wire had been in its former place, the chances are there would have been trouble. As the guard wire and erection cost about \$2.00, I thought it a good investment. The electric light companies should take the lead in the matter of protection where they go near telegraph or telephone wires. If the other electrical companies refuse to assist, public sentiment will soon compel them to.

In all new work I intend to place iron guard wires put on glass over all high potential wires, and only have the stretches to connect from one pole to the next, that is, one stretch will be tied in the groove of the insulator, the next over the petticoat of the insulator and so on, so there will be no connection from one stretch to the next. I don't consider a continuous guard wire of any advantage, as it may be in contact at one point with a telegraph wire and at another with an electric light wire, thus forming a cross between the two.

If necessary to go near a telegraph pole, I put a cross arm on the pole, if possible, but never use the inner pins for arc wire if there are telegraph wires above. My reason for not using the inner pins is to prevent line men when going up and down a telegraph pole coming in contact with high potential wires. Telegraph linemen do not take the precaution that electric light linemen do, as they are used to harmless wires.

If a wire is in such a position that it can sway and touch a guy wire, building or anything that can make connection to ground, I make it a point to put an insulator at that very point. If a wire runs in front of a building I want that wire very well protected.

I always make it a point to live up to the rules of The Board of Fire Underwriters. Their rules are not all the best, but it does no harm to go by them and make wires a little safer than they call for.

If I see carpenters or painters working near a wire, I caution them to let the wires alone and then see that they do so, as they generally take delight in twisting a wire around a lightning rod or pipe.

I believe in and use good insulation for new work, but always construct a line, using the same precautions I would if a bare wire was used.

I always make it a point to insulate the hanger boards of arc lamps if possible. This I did on some lamps and find a marked improvement in insulation. This only costs a few cents per lamp and was money well spent. I always, when possible, put low potential wires on porcelain or glass insulators. It costs very little more than cleats, and makes a much better insulated line, especially in damp places.

ELECTRIC LIGHTING IN WASHINGTON.—The evils of trying to solve the underground wire problem through the instrumentality of irresponsible persons are exemplified in Washington. So unsatisfactory have been the efforts to abolish overhead wires by placing them underground that Congress has had to take a hand in the matter and prescribe certain regulations. No one, except companies now organized and doing business in the District, will be permitted hereafter to lay wires underground. This action excludes from Washington such companies as the Westinghouse, Edison and Thomson-Houston, and as the local company and the gas company are practically one in their efforts to keep competitors out of the field, there is likely to be lively times some time before long. After all that has been done towards putting the wires underground, there is very little to show. It is suggested that the Government ought to take hold of the matter, in part, and investigate the subject thoroughly, and co-operate with the private concerns in placing the wires underground in the most reliable manner.

THE PHENOMENA OF RETARDATION.

The phenomena of retardation in telegraphic circuits are not altogether electro-static, but in part electro-dynamic. The magnetic properties of iron—*i. e.*, the material of the wire—are capable of themselves of giving rise to reactions in the current passing through them, aside from those due to electro-static induction. The passage of a current in an iron wire produces a magnetic field, which in the expansion or contraction of its lines of force reacts on the conductor, and can produce a more or less marked electromotive force. The action, in all cases, would be in accordance with Lenz's law, and, consequently, the effect would be to tend to oppose the current as long as it was *increasing* during the beginning of an impulse, and thus produce "retardation," while at the end the effect would be to *prolong* the impulse and produce the phenomenon of "tailing" or "kick." When a current is passed through an electromagnet, the motion of the lines of force as they expand is such that in cutting the coils of the wire, it gives rise to a *counter* E. M. F. that diminishes the main E. M. F. by so much, while when the current is suspended, the collapse of the lines of force gives rise to an E. M. F. in the same direction as the main E. M. F., and, consequently, tends to prolong the current. This is what happens in the iron wire, only in this case the wire fulfils the function of the iron core of the magnet as well as of magnetizing helix.

The proof that this action accounts for a good deal of the so-called electro-static effects of wires is shown. Copper-iron wire, is remarkably free from them, while, on the other hand, it ought to exhibit them to a greater degree on account of its greater "capacity" (length x surface.) The reason why copper does not give rise to the electro dynamic induction to the same extent, is that it is a so-called non magnetic (diamagnetic) metal; it does not have the power of collecting and concentrating lines of force which iron possesses in such an eminent degree; in a word, the magnetic field around the copper-wire is *rarer* than that around an iron wire of the same size, and the same motion does not give rise to the same effects.

THE WESTINGHOUSE ELECTRIC PLANT TO BE REMOVED.

The Westinghouse Electric Company, which has its main plant almost in the heart of Pittsburgh, has decided to move out of the city. It will erect, as soon as possible, immense new works near Brinton, on the main line of the Pennsylvania railroad, about twelve miles from Pittsburgh.

This removal is made necessary on account of lack of space and the cost of enlarging a plant in the city. The present buildings are to be sold and will yield \$500,000. This money will be used in the construction of the new shops, which will occupy a plot of fifteen acres. It is the purpose to lay out and build up a new borough surrounding the plant, as is being done at Wilmerding, several miles distant, where the new Westinghouse air-brake works are nearing completion. The electric company since a year ago has increased the number of its workmen from 600 to 1,300, and these, with their families, will give the new town a population of about 5,000 souls.

The company in 1889 set up 134 central stations in Europe and America, with an aggregate of 234,250 lights. This represents a business of between \$4,000,000 and \$5,000,000. The new town will have connections with the Pennsylvania and Vanderbilt systems of railroads.

The servant girl of the future will refuse employment in a family that does not use the electric light in the house.

THE FRANKFORT ELECTRICAL EXHIBITION.

The committee in charge of the work of organizing the International Electrical Exhibition at Frankfort-on-the-Main, Germany, have issued a general circular on the subject. Among other things it says:

We have obtained the assignment of land belonging to the State, situated between the town and the new central railway station, having an area of 50,000 square metres, and which will be directly connected with the State lines of railway, so that the arrival and departure of articles for exhibition may be effected in the simplest and least burdensome manner. Thanks to the favorable conditions, the direction of the exhibition will be in a position to reduce to a minimum the expenses to be paid by exhibitors. The direction undertakes to supply exhibitors with sufficient motor power, and to obtain freedom from customs dues and transport facilities for exhibits from abroad. The exhibition will include everything which is connected with electricity so long as it be new or represent a notable progress compared with the special exhibitions of Paris, Munich, and Vienna. The exhibition will remain open from June 1st to October 31st. The exhibits will be divided into 12 groups as follows:

1. Electric motors, steam engines, hydraulic motors, aeromotors, gas motors, as well as their boilers and accessories.
2. Production of electricity.
3. Means and processes for the distribution of electricity.
4. Accumulators and transformers.
5. Electrical transmission of power and its application to industry.
6. Electric lighting installations, &c.
7. Telegraphy and telephony, lightning conductors, electrical apparatus for protection from fire, thieves, etc., electric bells.
8. Application of electricity to railways, tramways, and ships, electrical railway signals, etc.
9. Electro-metallurgy and electrolysis.
10. Electrical apparatus of precision, measurement, acoustics and optics.
11. Electro-therapeutics.
12. Publications relating to electricity.

DAMAGED ELECTRIC LIGHT PROPERTY.—Business men experienced in electrical affairs, but in no way connected with any of the electric light companies, say the damage to those corporations that has been uselessly and unnecessarily inflicted will exceed a million dollars, and that burdens have been put upon the companies which will increase their deficit by another million before the end is reached. Incalculable damage to electrical progress has also been done by New York's demonstration of how easy it is to ruin electric light securities.

The directors of the New England Telephone and Telegraph Company, of Boston, have declared a dividend of \$1.25 per share, payable Feb. 15th.

RESUMPTION OF ELECTRIC LIGHTING.—A gentleman, who is said to practically represent all of the electric light companies, asserts that the city will be re-lighted by electricity within 60 days.

"The companies," he went on, "have been hard at work getting their cables under ground. They have been delayed somewhat by the manufacturers being unable to make the cables fast enough for the demand. The cables, however, are being shipped here rapidly, and the subways are being built with a fair degree of rapidity. Of course, all the city districts will not be lighted by means of underground wires within sixty days, but wherever there is a subway it will be occupied by electric light wires. Where there are no subways the streets will be lighted by overhead wires.

ACCIDENT TO A CABLE.—While a cable ship was laying a submarine cable recently, between Zanzibar and Mombasa, the cable was broken.

PHILADELPHIA NOTES.

The annual meeting of the Franklin Institute was held last week. The reports showed a favorable condition of progress. The receipts from all sources for the year amounted to \$32,462.97; payments, including investments, \$30,290.64. The report of Secretary Wahl embraced a review of the year's industrial and scientific progress. The following officers were elected: President, Joseph M. Wilson; Vice-President, Charles Bullock; Secretary, William H. Wahl; Treasurer, Samuel Sartin; Managers, Charles H. Banes, Washington Jones, Edward Longstreth, Isaac Norris, Jr., Theodore D. Rand, Stacey Reeves, Coleman Sellers, F. Lynwood Garrison; Auditor, Samuel H. Needles; Committee on Science and the Arts, Arthur Beardsley, Hugo Bilgram, J. H. Eastwick, N. H. Egerton, G. M. Eldridge, John Hall, Rufus Hill, George A. Koenig, E. Alexander Scott, H. W. Spangler, Coleman Sellers, William H. Wahl, John H. Cooper; F. Lynwood Garrison, Wm. Harkness, Jr.

It is proposed to build an electric railroad from Ashbourne to Cheltenham, suburbs, to afford rapid transit facilities, and aid in the development for suburban residences of that portion of Montgomery county contiguous to the Tacony creek, along which the line is to run. It is proposed to operate with the line an electric light plant.

At the annual meeting of the Edison Electric Light Co. of Philadelphia, held last week, a report was presented showing the monthly expenses to have been about \$8,000, and the income \$20,000, leaving a monthly profit of about \$12,000. The debt is about \$200,000. The officers of the corporation were elected as follows: President, L. D. Brown; Vice-President, B. K. Jamison; Secretary and Treasurer, A. V. Sloan; Solicitor, Samuel B. Huey; Supervising Engineer and General Manager, Wm. D. Marks.

Mr. Maris, a member and manager of the house of Thomas H. McCollin & Co., No. 635 Arch street, tells the AGE correspondent that they are handling a large quantity of their draughtsmen's sensitive paper for making blue prints. The house make quite a specialty of this paper, and as it is particularly adapted to the uses of electricians and electrical engineers, their business in the electrical field is rapidly increasing. The house is an old and reliable one in the photographic supply and apparatus line, and is being extensively patronized in this direction as well as in the way of draughtsmen's paper.

Mr. W. O. Snyder, the manager of the Spellier Electric Time Company, reports that the company have now in use nearly five hundred clocks, and as the system has proved a superior one, the business is growing largely. The company are now negotiating for the establishment of branch offices in Boston and other large cities. The rapid strides taken by Philadelphia in the electrical field is convincing evidence that it is not so proverbially slow as some of the paragraphers assert it to be.

There is on foot a scheme, of which William Wharton, Jr., is at the head, to purchase the Citizens' Passenger Railway system, which covers a large portion of the populated section of the city in a northerly and southerly direction, and to amalgamate it with the Lehigh Avenue Railway, which is already owned by Mr. Wharton's company, and which will soon cover in an easterly and westerly direction the northern, northeastern and northwestern portions of this city. These lines are to be operated by the Wharton electric system, and in connection with the proposed gravity railway in and through Fairmount Park (of which Mr. Wharton, heavily backed by leading capitalists, is the promoter), will control an immense amount of traffic, as it practically covers every portion of the city.

ELECTRO.

TAPPED BY TELEPHONE.

In the winter of 1884-5 I was managing editor, city editor and the entire reportorial corps of a little daily paper in a Colorado mining town. Associated Press dispatches were out of the question. We had to depend upon the Denver papers, which reached us the same evening, for our telegraphic news. But occasionally the trains got snowed up in the Pass for a week or more, and then we were in a box. On one of these occasions we hadn't had a mail for four days, and things were looking blue.

The town had gas and water works and a big hotel as reminders of its departed boom, and it also had a telephone line which connected with another little town thirty miles further up in the mountains, on a branch of the same railroad. The telephone in the station thirty miles away was connected every night with the one in our office before the central office closed, so that in case of an accident in the mines we could get the news.

Several times while using this telephone I had noticed that late at night, when all was still, the clicking of the telegraph instrument in the station up in the mountains could be distinctly heard over the wire. This suggested an idea. The railroad wire was used as a news wire late at night. If we had anybody with an ear acute enough to read that faint ticking in the telephone instrument we could learn what was going over the wires. The business manager had been an operator, and a good one, back in the States. He tried the instrument, and found that the scheme would work. The next morning we had a column of "specials," including two or three items of Washington news, which were of special interest just then, as every second man in the town was a candidate for some office under the incoming Democratic administration.

The editor of the rival paper rushed to the telegraph office to inquire what it meant. He was told that we had received nothing over the wire. With the train snowed up on top of the Pass "faking" from the Denver papers was out of the question. Yet there were the dispatches, and unmistakably genuine, too. The wires had been tapped, that was certain, but where, when, how? The railroad people ordered an investigation, but discovered nothing. Nobody thought of the clicking instrument in the closed railroad station thirty miles away, and the marvelous carrying power of the telephone in that clear, still mountain air.

Our brother editor on the rival sheet thought it was a "dead, cold fake," but he was afraid to say too much about it, as he had run out of paper and we had him at our mercy, at least until a train got in. Of course, the secret was jealously guarded in the office, but the "specials" were kept up until the train got through. Then we quit. The business manager was a conscientious man and didn't believe in stealing news when it could be obtained in any other way. Besides, he objected to the work.—*New York World.*

HOLIDAY PRESENTATION.—Among the many happy incidents of the holiday season was the presentation by Mr. John Hoey, President of Adams Express Co., to P. J. Casey, manager of the 8 W. 23d st. and Long Branch offices, of a handsome diamond and turquoise scarf-pin which Mr. Hoey brought from the Paris Exposition.

The following conversation between two New York operators on a St. Louis wire evidences the fact that New York operators are not unlike the generality of their brethren, at least in point of "raising the wind."

"Say, why don't you strike Fat for some?"

"Has he got any?"

"He had some yesterday."

"All right, I'll hit him when I come down."

"You'll have to hit him hard."

"Oh, I have reduced that to a science."

"You had ought to by this time."

Mr. M. H. Crane, of The United Press, in this city, has the sympathy of his numerous friends in the death of his daughter. She was 10 years of age.

TELEGRAPH FACILITIES IN OMAHA.

The Western Union Telegraph company shows an increase of 15 per cent. for 1889 over the business of 1888. The operating and business department has been thoroughly remodeled and other improvements have been made, until the local office is now one of the best appointed in the country.

During the year ending November 30, 1889, there were 3,939,629 local messages sent and received, and 4,839,002 messages relayed. These figures do not include the great amount of press matter received and sent. There are 161 employes on the Western Union company's pay rolls in the main Omaha office and branches in this city, and the weekly salary list is over \$2,000. There are eighty-three circuits outside the city covered by the local office and 5,300 cells of battery are required.

The third district, comprising all of Nebraska, Kansas, Wyoming, Utah, Montana, New Mexico and Colorado, and a part of Iowa, Missouri and Texas, is under the supervision of J. J. Dickey, with headquarters in Omaha. The main and branch offices in the city are under the management of J. Levin, with the following assistants: Day—J. B. Twiford, chief operator; W. J. Rasland, traffic chief; E. B. Ragon, wire chief. Night—W. J. Lloyd, chief operator from 5.30 P.M. to 1 A.M.; J. B. Pritchard, traffic chief from 5.30 P.M. to 1 A.M.; W. E. Wakefield, chief operator from 1 A.M. to 8.30 A.M.; E. J. Burke, Wheatstone, chief days; J. T. Eshmon, Wheatstone, chief nights.

H. E. Jennison, superintendent of construction, has charge of all construction and repairs in the district, and has more than 300 men constantly at work.

POSTAL TELEGRAPH LINES.—Five years ago the Pacific Telegraph company opened an office in Omaha. It was on a small scale with only a few employes. Now the company has thirty men on its pay roll, and dispenses \$1,800 a month in salaries. W. S. Dimmick is the local manager, and has charge of all the company's lines in Nebraska. There are twenty offices in the State. The business for 1889 shows an increase of 25 per cent. over that of 1888. The need of better service for Omaha has led to an expenditure of \$75,000 during the year just closed with that object in view. New wires have been stretched from Des Moines to Omaha for Omaha business exclusively. Previously the Omaha patrons of the company were at the mercy of a single circuit for eastern business that went by way of Kansas City and St. Louis. Now there are a dozen different circuits by way of Des Moines, St. Joseph, Kansas City or St. Louis. The Pacific lines are now known as the Postal Telegraph Cable company.

TELEPHONE FACILITIES.—The telephone system of Omaha is owned by the Nebraska telephone company, which has its headquarters in this city, and extends to nearly every city and town in the State. The total number of subscribers in this city 1,436, is an increase of 140 over the preceding year. Following are the officers of the company: S. H. H. Clark, president; C. E. Yost, vice-president and general manager; Flemon Drake, general superintendent; L. H. Kerty, secretary and treasurer; V. P. Musselman, cashier.

DISTRICT TELEGRAPH.—The American District Tel. Co., of Omaha, operates an extensive messenger, cab, express and night-watch signal service. It gives employment to twenty men and forty to fifty boys. It has nearly 1,000 signal boxes in operation in the city. L. H. Kerty is president; J. S. Dickey, vice-president; L. M. Rheem, general manager; J. Donnelly, Jr., superintendent.

SUCCESS OF THE ELECTRIC AGE.

What THE ELECTRIC AGE has done for the profession is best shown by its history, from its foundation up to the present time. In 1883 *The Telegraphers' Advocate* was established by Messrs. J. B. Taltavall and John Mitchell. In the course of its natural development its name became too narrow in its application. The paper was then re-christened THE ELECTRIC AGE—to signify its scope of usefulness. Its growth has been steady from birth, and within the past year its development has made very rapid strides. It is now paying over \$3,000 a year for commissions alone to members of the craft throughout the country. After the withdrawal of Mr. Mitchell from the paper, its affairs were conducted solely by Mr. J. B. Taltavall. As business increased, however, it was necessary to add to the staff of the paper—a live advertising agent was necessary. Mr. R. J. Gray, of the Western Union operating force, was selected, and now has sole charge of this department. That the selection was a wise one is evidenced by the large number of friends he has made for the paper, and particularly by the success with which he prosecutes his specialty. The advertising, editorial and general business labors on the paper were fast increasing, and it was necessary to look for some one to pay particular attention to the editorial work. Such a person was found in Mr. Thomas R. Taltavall, who was for many years Superintendent of Telegraph for the Associated Press. It was argued that Mr. Taltavall's experience in the news service for so long, and his expert knowledge of electrical matters, would be important factors in the advancement of the paper, and there is every indication that the selection was a wise one, although it is but since the 1st of January that Mr. Taltavall began service with the paper. His entire attention is given to its editing, while Mr. J. B. Taltavall attends solely to the general business management. When it is remembered that the entire business was not long since conducted by Mr. J. B. Taltavall alone, and that now each of the three departments is managed by a distinct head, some idea of the magnitude of the growth of the paper may be formed. The last person taken from the telegraphic ranks is Miss Spicer, of the distributing department of the Western Union operating room at 195 Broadway. Miss Spicer attends to the correspondence, etc. Besides these, it has practically in its employ other telegraph people throughout the country in the capacity of agents. The usefulness of the paper is not limited to its natural sphere of operations. It has kept track of and recommended to outside concerns many live and enterprising members of the craft, who have thus been benefitted and placed in a position to vastly better their condition. It is hardly necessary to say, in conclusion, that when competent help is needed at any time, it can be found in the telegraphic ranks, and we are so well pleased with our experience in this regard that we do not propose to look elsewhere.

A DYING OPERATOR ALONE AND SNOW BOUND.—A sad feature of the recent snow blockade on the Central Pacific road was the imprisonment of a telegraph operator at Cascade, who was entirely alone and dying of pneumonia. There were eighteen feet of snow around the station, and the nearest person was eight miles away. John Coghlan was the operator's name, and a party on a snow bound train sixteen miles from Cascade, proposed to go to his relief as soon as it was possible to get the train through.

A LIVELY COUNTRY OFFICE.—For a country office, White River Junction, Vt., probably outranks all in the magnitude of business handled. Eleven operators are employed, and 1,500 messages are handled daily. It is a repeating point of considerable importance, and all of the principal eastern cities are worked with direct.

PRIZE STORIES.

(No. 5.)

"Oh, dear! I wish some one would steal me, I'm tired of this hum-drum telegraph work, and if I could get away from it I'd be happier, I know," said Louise Markham, one morning to her poor mother, who no doubt found her household duties as monotonous as the work her daughter had to do in the office some little distance from their humble home.

The next evening as Louise was returning from work, 'twas a little later than usual, as she had worked an hour extra, she was accosted by a very flashy-looking young man, who inquired if he might accompany her. It was dark, the weather was stormy, and the right kind of company would have been very agreeable; but, although Louise was not naturally timid, there was something in the tone of this man's voice that startled her, and, without making any reply, she hastened on. As luck would have it, the next moment she slipped and fell. Instantly the young man was at her side offering his assistance, and as the pain in her limb, which had been sprained in falling, was excruciating, he begged for the privilege of calling a cab to take her home.

"Oh, what would my mother think? She would be frightened, and, besides, you are a stranger; it would never do," said the girl. But the young man was so persistent, and the pain in walking so great, she finally consented, and a passing cab was hailed. Assisting her to enter the cab, the young man said he would ride with the driver. After going, as she thought, a considerable distance, and still apparently not nearing home, she began to feel alarmed, and her words of the night before, "I wish some one would steal me," came back to her with great force. She wondered if it could be any harm would come to her, and she said to herself she would never again complain of her monotonous work if only she could reach her home and the mother who was now, she knew, anxiously awaiting her.

The storm, which had been threatening, was now upon them and raging with great fury. Poor, frightened Louise was about crazed, and whether to open the door and jump from the cab, which was going at a rapid pace, or to wait until they came to a standstill she did not know, but quickly deciding upon the former, she threw open the door, made a spring and awoke—to find herself in her own room, the sunshine streaming in through the half open blinds and her adventure all a dream. What a pleasant and happy realization, and it was with a light heart that she sought her mother, told her of her adventure and its happy termination, declaring she would never again find fault with her lot.

A MEMORY.

(No. 6.)

"Good evening, Dick, walk right in, make yourself at home. Excuse me for calling you by your given name, but it seems more friendly. I told wife I thought you would be up this evening, so we waited tea. Now, don't refuse,—surely another cup of tea won't hurt you, and wife and I often get lonesome since little Millie died. But excuse me a moment, till I see if the lamp is burning—I have to watch it pretty close these windy nights."

Such was the greeting I received when I called to see the agent of LeMaine, where I had been sent as day operator. Being a stranger in the town, I had accepted his kind invitation to call.

While he was absent, I couldn't help but notice how cosy and homelike the room was—the easy chairs, choice pictures on the walls, and a bird cage in the bay window. One picture of a fair-haired little girl about two years old, attracted my attention and I went across the room to get a better view.

"Pretty picture, isn't it Dick? I knew you would say so—and of course you want to know who it is. It's Joe's little girl.—why, don't you know Joe? He is the agent at Wayne, on the C. & M. But wait till after tea and I will tell you the whole story—if it can be called a story."

It's four years since this office was opened, and I had been wondering who the operator would be, and whether he would be pleasant or not. It was a lonesome station here then, and I was glad I would have someone to talk to.

But it was several days before I could learn how to take him. He was good natured, but was so quiet and reserved, would seldom speak unless spoken to. It was several weeks before I learned much of his history, not that I was inquisitive, but I knew there was something on his mind, and I wanted to help him.

It seems he had run away from home when only fifteen, simply because he couldn't have his own way. He had never heard from home since. Lately he had been wondering if they would forgive him if he went back. I told him I was sure of it—I knew his mother was waiting anxiously for some word from him.

He didn't have courage to write though—was afraid his father would burn the letter. But I could see there was a silent influence at work on the better part of his nature, and sooner or later it would triumph, and it did.

His boarding place was nearly a mile away, and in stormy weather I used to have him stay here over night. He was so much company for my little Millie too. He had a good tenor voice and would often sing her to sleep. She was only three years old then, but seemed nearer five—she made such wise remarks. Dear little girl—she was sick with the fever only a week, and the last person she asked for was Joe. But I haven't told you why he was not here. A few days before, one of the operators up the road had sent him a book to read, and in glancing at the newspaper it was wrapped in, as we all do if it is published in a distant town, he saw an item that set him to thinking harder than ever. It was a notice that the old home was to be sold at sheriff's sale within three days.

Joe had several hundred dollars that he had saved before he came here, and he took that and started home the next morning.

Two days more and Millie was taken with a fever, and being so frail we knew she couldn't last long. She missed Joe so much, and when we told her he had gone to see his mamma, she seemed to understand and was more quiet. She was unconscious till a few hours before she died. She watched two or three trains and when he didn't come, she looked up in my face, with such a disappointed look and said, "Papa—can't you call up that big office and ask Joe to come and sing to Millie—Millie so sleepy—tell him to sing in the morning when I wake up." Those were her last words. Yes, she heard singing when she woke up, but it was softer and sweeter music than Joe's.

Ours was a sad home during the next week, and when Joe returned he missed her nearly as much as we did. He was so changed, had so much more life and ambition that I had no need to ask about his reception at home. He told me how strange it seemed to walk up the old familiar street, and have no one to speak to him—thinking him some stranger. But his mother knew him, and it was worth more than any amount of gold to him to see the mother-love in her eyes. When he asked for his father, the tears came to her eyes, and he knew that he had come too late, but not too late to save the home for his mother.

Well, he has been married three years now, and this is his little girl's picture. She is named after our little one, and resembles her so much that we hardly know the difference. We didn't have any picture of our Millie—that's why we think so much of this."

I am an old man now, but I never see the

picture of a fair-haired little girl, without thinking of the little Millie that died, and of Joe.

I often wondered how it would seem to leave home in that manner, and go back after a few years—only to find my father gone, and the old home for sale. We that have parents still living, let us be with them while we can—if not—who knows—we may be a day or an hour too late."—C. R.

A BIT OF REMINISCENCE.

(No. 7.)

Twelve years ago, in a small city not far from New York, a half dozen young men built for their amusement a telegraph line connecting their respective homes. They all had an idea, only, of the telegraph art, and were far from being experts.

As time wore on they came to the conclusion that in order to make things pleasanter all around, they should invite one or two of their lady friends to come in on their little "circuit." One lady did join.

There were many amusing incidents connected with this private line, for only one of which I have space.

Our young lady friend became so much interested in the thing, that it used to keep not only her, but her whole family awake nights—the incessant clicking of the instrument. For, you see, between learning to telegraph and chatting with the boys, she was a fixture at the desk.

The noise—though pleasant music to her ears—was very monotonous to the rest; so the head of the family determined to stop it in his own decisive way.

One day, in his daughter's absence, he cut the wires outside of the window and joined them, thus cutting off her evening's entertainment.

She, however, nothing daunted, and being a "chip of the old block," purchased enough wire to run her "office" into her own bedroom. She hired her little brother to help her, and by means of twine, ladder and broom, they ran the wire up the back of a three story house through the skylight and down.

A good many days elapsed before the paterfamilias knew what had happened. Of course, then the joke was on him; and he, in turn, taking things calmly, invited all the boys to the house, and gave them a little supper.

By degrees all hands on the wire became acquainted, and some were and are still good friends.

In the summer of '79 this girl became possessed with the idea of getting something to do at telegraphy. So, through two influential friends, a position was obtained for her with a salary of \$30 per month.

The company must have thought that same salary very munificent, for when she signed her first voucher, the manager asked her what she was going to do with all that money.

To follow our friend through all her experiences in the art for the next five or six years would not interest anyone, probably. Suffice it to say that she was successful, as far as glory went, and eventually married an operator, and is to-day the mother of two lovely boys, one of whom is beginning to make dots and dashes with his spoon at the table—"doing like papa does,"—but who, his mother vows, shall never follow in his father's footsteps.

All this to show that we may all rise if we but try—and that we are all in the hands of Fate—and what an immense influence a trifling thing had on the life of at least one person.

It is suggested that a small battery capable of supplying sufficient current to two twelve-candle power lamps for eight hours should be placed under the seats of street cars. This could be very easily carried out.

ON THE RESPECTIVE MERITS OF CONTINUOUS AND ALTERNATING CURRENTS.

The question has been very often discussed whether it is preferable to make use of continuous or alternating currents in an installation of any importance; the question has been for some time to the fore, and the most celebrated electricians have held diverse opinions as to the respective merits of the two systems.

Undoubtedly each system has its advantages and its demerits, and the recent progress made in alternating currents has placed them in a position to hold their own in the controversy.

If we discuss the matter, says M. Dubourg in *La Lumière Electrique*, it is because we have seen in a foreign publication (*Elektrotechnisches Echo*) a lengthy argument in favor of continuous currents and accumulators, which appears to us sufficiently interesting to be reproduced.

The article commences with an exposition of the system of continuous currents with 2, 3, and 5 conductors. We quote from the principal passages.

In the old central stations the radius of distribution does not extend beyond 500 metres. The conductors in the dual conductor system are not so costly as to furnish an argument for their abandonment.

Their weakness is in the area of distribution, which makes it necessary, generally speaking, to instal the central stations in the quarters to be lighted; that is to say, in the most populous quarters.

The invention of transformers has furnished a method of transmitting electricity from a single station even to out-of-the-way quarters. True it is that to do this it is necessary to waive some of the advantages obtainable from continuous currents when employed with the dual conductors. It is necessary that the primary conductors should be worked at a high tension, and, consequently, that transformers should be introduced to form an intermediary; thus introducing a new cause of accidents and losses. It has been found necessary to abandon the use of the continuous current to some extent.

The progress made in transformers has compelled a corresponding advance towards perfection in the system of continuous currents by making the principal conductors work at the highest tension, thus allowing for a diminution of the section of these conductors.

From this has resulted the system of three and finally of five conductors; from it also we have the system of indirect distributions with the aid of secondary generators, as well as accumulators, transformers of continuous currents, and dynamos for transmission to long distances.

We will not speak of the two last because, within our knowledge, their employment has not been successful so far. The principle of the three-lead system is as follows: There are always two groups of lamps in the principal circuit, and these are joined together in a series. These groups are connected together by a conductor which derives all difference of potential from the side of the dynamos where the tension is least.

In placing the lamps in a series of twos we can make use of conductors of a section which is less by half, and afford a loss of tension double that of the dual conductor system; it will be enough therefore if the principal conductors have one-fourth the diameter which they would otherwise have.

We will now point out a primary drawback—viz., that instead of one large dynamo we must make use of two small ones, and consequently we shall require duplicate measuring apparatus and commutators. Further, it will be necessary always to have the same number, more or less, of lamps working in each half of the circuit, as otherwise there will be no compensation.

It is possible to imagine the three-conductor

system in another form: Instead of two dynamos in circuit, each of them with 100 volts difference of potential, we have one large dynamo with a double E. M. F.

However, as in this case the conductor-compensator cannot be led up to the dynamo, it will become necessary to insert in both parts of the circuit an absolutely equal number of lamps. But as in practice, even with an excellent installation, this is hardly possible, it will also become necessary to insert resistances into the part which has least current, and to keep them there until the currents in both portions become equal. The best compensation resistances will be found to be batteries of accumulators, because they give back a part of the stored-up energy, and allow of a part of the electricity they have received being used, and that directly their circuit receives an excess of current.

One advantage of the three-conductors over the two-conductors system is that it allows of the current being economically distributed within a radius of 1,200 metres. The disadvantages of the system—which, however, are not fundamental—are: that the electro-motive force of the electric installations of the central station is a little higher, the regulating is a trifle more complicated, and the installation for large buildings is rather more costly, it is necessary to introduce the three conductors into each building, and that the lamps must be divided into two groups.

Siemens and Halske say that with the three-conductors system it is possible, without augmenting the cost of the wire, to dispense with the resistance adjustment for the principal conductors; and they say this will mean a great simplification in the regulating apparatus.

M. Schuckert admits that the system allows of economy of wire as compared with the two-conductors system; but he prefers the latter as being the more simple to instal, and as offering greater security in use.

On the other hand, the Helios Company, of Cologne, instances two cases of installations in which the conductors were destroyed by polarization of the dynamos.

The five-conductors system is only the logical development of the three-conductors system. It is composed of two portions, having each three conductors, and placed in series. It has been recommended by Siemens and Halske. It may be worked either with the separated dynamos, as in the case of the three-conductors system, or with one dynamo and four compensation resistances, or four batteries of accumulators.

The tension in the principal conductors is about 400 volts; that between the two neighboring ones is about 100 volts.

The branching off of the conductors may occur at a subordinate station, and, in certain cases, one may fix the place for producing the current at a distance from the distributing zone.

The central conductor may, if necessary, be divided into two, so that on either side of the road three conductors shall pass, each side being served by its line of three cables.

So far, we have no really practical experience of this system; further, its application has been very contradictory.

Siemens and Halske, thanks to an ingenious combination of accumulators and of incandescent lamps placing themselves in circuit automatically, thanks also to the method of disposition invented by Thompson, hope to be able to maintain without difficulty an equal tension in the four circuits of consumption.

If we may believe them, the laying of the canalization is not more complicated than in the three-conductors system, since the distributory conductors are composed of three wires.

Mr. Miller observes, that the cost of the system is greater in consequence of the great number of points from which the current is taken; of the very great number also of apparatus needed for the measuring, circulating and

regulating of the current; of the very great costliness of house installation, and of the necessity for distributing the consumption in four equal portions. The difficulty of distributing the current and of regulating it will limit the application of the system unless recourse is had to accumulators.

According to the Helios Company of Cologne, the five-conductors system is a very dangerous one, owing to the 400 volts tension which it demands. This system, according to the writer in the *Elektrotechnisches Echo*, permits of a rational distribution of energy to a distance of 3,000 metres from the central station. On the same authority we learn that stations on this system are going to be established at Trent, Vienna, Paris, and Königsberg in Prussia.

As regards Paris we believe the Clinchy section is the one which has been chosen for this purpose, but we do not know whether the plan will be carried out. There is nothing to prevent the employment of systems with more than five conductors for the distribution of continuous currents, but then the ramification at the points of consumption and the maintenance of the tension would be very difficult. The number of conductors of batteries of accumulators or of resistance required would be so great that this method of direct distribution of the current may provisionally be looked upon as impracticable. Furthermore, the commutator, which is part of all continuous current machines, will, practically, not permit of the production of currents at a very high tension.

It is possible, however, to achieve this high tension, not merely by direct ramification, but also by the aid of transformers and of secondary generators, especially with the assistance of batteries of accumulators.

We have, for example, ten groups of accumulators inserted in successive series; from a distant station they are charged with 1,000 volts tension; for the discharge they are grouped in parallel, and arranged in the lines of distribution at 100 volts tension. According to our authority, there are many partisans of the alternating current, even, who admit that this system would be the better did not the accumulators leave so much to be desired as regards their price and the loss involved, for which, so far, no remedy has been discovered.

Mr. Kittler proposes to organize the central station at Frankfort with alternating currents, with the design of ultimately transforming it according to the principle above mentioned.

Another function reserved for accumulators is to serve as a reservoir in case of disturbances taking place in the working of the dynamos. With accumulators in reserve in the secondary stations, we could better count upon being able to furnish the light without fear of sudden interruption; moreover, the dynamos would be considerably relieved during the evenings, so that the installation of the machines could be reduced; and, furthermore, the principal conductors might be smaller; lastly, the day service and the late night service, which are so costly without accumulators, might become economical.

The day service without accumulators is as expensive as having a great number of central stations, especially those which make use of alternating currents, suspending the service during the day.

The author of the article in the *Echo* mentions some criticisms on the employment of accumulators.

Siemens and Halske estimate that, the factories being only in full work during one or two hours of the night, the employment of accumulators will admit of the equalization or regulation of the work.

They, therefore, recommend the use of accumulators where the consumption is great.

M. Ruhlmann thinks that in a region where electric energy is constantly at work accumulators are not needed, except in a small num-

ber of cases, such as for relief lighting in case of sudden extinction, and for electrolytic applications.

According to the Frankfort Commission, it is better, in a large installation, to have reservoirs of electricity than to have large machines working during the day. When the consumption falls off motors will be utilized in charging the accumulators; but in order to obtain all the results possible, they must be distributed among divers points, such as secondary stations, in order to relieve the cables.

It should be mentioned, says the author, that the advocates of continuous currents exaggerate the cost of the depreciation and working of the accumulators.

He enumerates the advantages of the continuous current system as follows:—

1. The continuous currents are extremely economical in work, and they may be placed in circuit as desired.

2. The slight tensions employed render the danger of death or fire much less.

3. The arc lamps fed by continuous currents are irreproachable; they burn steadily and noiselessly.

4. The motors cannot be too highly praised; it is equally easy to maintain a constant speed as to vary this speed at will.

5. It is possible to accumulate electric energy and apply it to various purposes.

The author then enumerates the demerits of the system.

1. The central station must necessarily be in the centre of the region supplied.

2. The zone of distribution is limited—that is to say, unless we choose to employ conductors at a price out of proportion to the profits, or to suffer enormous leakage of electricity.

3. The system is too costly for use in sparsely populated quarters.

4. The arc lamps fed by the continuous currents must be connected in series of twos, or the energy of the one must be taken up by a resistance.

The author deals with an objection taken by the Frankfort Commission, viz., that the degree of efficacy of the electrical apparatus of a central station is only shown by the amount of coal consumed, and that this represents only a feeble proportion of the total cost of the establishment and of the distribution of the electric current.

This assertion is in accordance with the facts, but it might lead persons, whose knowledge of the whole question of central stations is slight, to believe that the quantity of coal is of little importance from the point of view of the profits to be made out of the enterprise, which is not the case.

The salaries, the cost of repairs, interest and depreciation for a well-installed central station are absolutely invariable in amount. That which varies with the activity of the factory is the cost of working, and not merely the consumption of coal. This cost of working, together with the wear and tear of the lamps, is the only thing which is variable in the installation, the receipts being fixed. The profits of the enterprise vary only in consequence of the variation of the cost.

Let us now proceed, with the author, to examine the disadvantages of stations working with continuous currents:

1. The necessity for the central station to be in the centre of the area supplied.

Land is costly. But for an ex-central station the cost of conductors and the uncertainty as regards the regularity of the lighting are greater in direct proportion to the distance. *Per contra*, the five-conductors system, being capable of supplying a radius of 3,000 metres, it is possible to place the central station at a considerable distance away.

Furthermore, whichever system be employed circumstances will arise to make the acquisition of this or that piece of ground necessary.

The noise made by the plant depreciates the

value of the surrounding property. By making solid foundations and by making use of large slow speed direct action dynamos, this drawback may be lessened, if not got rid of altogether. The working of the central factory will not be found more troublesome than is the case with numerous other enterprises, especially if towards the end of the night accumulator working is used.

There is the fetching of the coal and the carrying away of the cinders, and these obstruct the roadway. The reply to this is that as the carts are loaded and unloaded in the factory yard the general traffic is not impeded. Sometimes, in carrying the coal, &c., it becomes necessary to make detours by which the net cost of coal is increased.

It is difficult to obtain water for condensing purposes, nor is there any outlet for it after use. We may observe that the factory should always be built where water is procurable; as regards the second objection it will very rarely occur.

The smoke is sometimes a nuisance to the neighborhood. This objection may be completely obviated; witness the central factories at Berlin.

There is danger from the explosion of the boilers, especially in the case of stations where the number of boilers is considerable. But has not a central factory more interest in avoiding explosions than any other, since the least irregularities will have their immediate consequences on the production of light?

The zone of distribution is limited as regards the present, unless we choose to employ conductors at a price out of proportion to the profits, or to submit to an enormous leakage of electricity; but this objection applies also to gas.

The author advances another objection, viz., that if private individuals take to installing electricity in their houses it will mean so many clients less later on. This is evident: but when later on the central station comes to offer its services to these people they will have recourse to it if it is worth their while.

An important question for large towns is whether the central station should be divided into several stations, or whether it is practicable to have secondary stations. Directly a central station oversteps a certain limit, it necessitates almost as many inspectors and *employés* as two small stations conveniently placed.

The cost of working is not considerable; there is only the cost of the first establishment, which is slightly lower. The division has the advantage of securing a much greater regularity in working; since should it happen that one of the central stations suddenly stops work, many quarters could be supplied by the second station, supposing that the two lines meet; and if by an accident one of the stations should be disabled, one could even provide for an intermediary supply of electricity in a combination of lines. During the day the electricity could be supplied by one station only, whilst the others were at rest.

When these two systems were contending for the lighting of London, it was insisted that it only required the breaking of the principal cable—caused, for example, by the falling in of a tunnel through which the conductors pass—in order to plunge an entire town in darkness. It is necessary, also, to take into account accidents due to malevolence.

THE WEST END RAILWAY OF BOSTON.—This road is meeting with great success as an electric railway. The open winter is very favorable to the carrying on of the work of extending the line. Everybody in Boston seems to be of one mind, and that is that the road is a great success.

Carnegie, Phipps & Co.'s steel works at Beaver Falls, Pa., are to be illuminated throughout by electricity.

ELECTRIC PATENTS ISSUED JANUARY 21ST.

419,618. Electric railway system. Thomas E. Adams, Cleveland, Ohio.

419,633. Galvanic battery. Wm. Burnley, North East, Pa., assignor of two-thirds to Chas. A. Hitchcock, same place, and Samuel A. Davenport, Erie, Pa.

419,642. Insulator for Electric Wires. Isaac P. Cornog, Philadelphia, Pa.

419,645. Telephone Circuit and Apparatus. John N. Culbertson, Buffalo, N. Y., assignor to the American Bell Telephone Company, Boston, Mass.

419,660. Electric Commutator. Ludwig Guttmann, Fort Wayne, Ind.

419,661. Dynamo Commutator. Ludwig Guttmann, Fort Wayne, Ind.

419,662. Electric Commutator. Ludwig Guttmann, Fort Wayne, Ind.

419,663. Method of producing alternating Electric Currents. Ludwig Guttmann, Fort Wayne, Ind.

419,664. Alternating current Motor Regulator. Ludwig Guttmann, Fort Wayne, Ind.

419,673. Electrical Railway System. Thos. H. Hicks, Detroit, Mich., assignor by direct and mesne assignments to the Electrical Invention Company of Michigan.

419,674. Shield or Protector for Electric Conductors of combined gas and electric fixtures. John C. Hollings, Boston, Mass.

419,709. Electric Railway System. Charles Richter, Camden, N. J.

419,710. Electric Protector System. Arthur C. Robbins, Brooklyn, N. Y.

419,727. Method of treating secondary battery plates. Charles Sorley, New York, N. Y., assignor to the Anglo-American Electric Light Manufacturing Company of West Virginia.

419,728. Electrode for Secondary Batteries. Charles Sorley, New York, N. Y., assignor to the Anglo-American Electric Light Manufacturing Company of West Virginia.

419,730. Galvanic Battery. Lucius T. Stanley, Brooklyn, N. Y., assignor to the Stanley Electric Company, Philadelphia, Pa.

419,731. Portable Faradic Battery. Lucius T. Stanley, Brooklyn, N. Y., assignor to the Stanley Electric Company, Philadelphia, Pa.

419,733. Cut-Out. Charles B. Story, Brunswick, Me.

419,740. Electro-Thermal Current Regulator. Frank C. Wagner, Ann Arbor, Mich.

419,753. Electric Locomotive. William H. Darling, New York, N. Y., assignor of two-thirds to Leo Bock, Jr., and Gardner P. Harrington, both of same place.

419,766. Electric Door Opener. Ado Glaeser, Brooklyn, N. Y.

419,771. Overhead Contact and Switch. Robert W. Hawkesworth, East Orange, N. J.

419,774. Galvanic Battery. William E. Irish, Cleveland, Ohio, assignor to the Irish Electric Company, same place.

419,776. Electrical Clock. Ansel B. Jones, Cleveland, Ohio.

419,805. Thermo-Dynamic Motor. Carl W. Weiss, Brooklyn, assignor of one-half to Chas. Kruse, New York, N. Y.

419,808. Electric Motor. Le Roy S. White, Waterbury, Conn.

419,829. Electric Lamp. Sam B. Cobb, Chicago, Ill.

419,841. Electric Railway. Mark W. Dewey, Syracuse, N. Y., assignor to the Dewey Corporation, same place.

419,861. Electric Reciprocating Tool. Harry N. Marvin, Syracuse, N. Y.

419,902. Automatic Fire Alarm. Eugen Wider, Stuttgart, Wurtemberg, Germany.

419,923. Electrical Conductor. Hiram H. Carpenter, New York, N. Y.

419,986. Mechanical Telephone. Robert C. M. Bowles, Boston, Mass.

ST. LOUIS W. U. NOTES.—We are now settled in our temporary quarters, which are located in the five-story building, No. 215 Pine street. The old quarters were completely ruined. In the evening of the same day of the fire a special relief train bearing Chief Electrician C. H. Summers, Assistant Superintendent Wm. J. Lloyd, Superintendent of Construction M. C. Bristol, and his assistant, C. H. Bristol, Mr. V. Kissenger, wire chief, Mr. E. W. Mayfield, and thirty linemen arrived from Chicago. They brought with them several car-loads of supplies, consisting of instruments, batteries, switch-boards, cables, office wire, and, in fact, everything necessary to entirely equip a large telegraph office. Early on the following morning the work of running wires and cables, of erecting temporary operating tables, placing the switch-boards, etc., was earnestly begun. Nor was the work slackened until the office was placed upon a thoroughly practical basis, with facilities for the handling of the large business with the usual promptness. The Ticker service, which was not disturbed by the fire, was resumed the following morning, and all stock quotations were furnished the Board of Trade and regular customers as usual, there being but one day during which the Company were unable to supply the regular market quotations. The Associated Press were fortunate enough to have traced out two of their wires, and having them run into a temporary office, they were able to furnish their regular day and night report to the several daily papers. The United Press having recourse to Postal wires, their service did not suffer. Superintendent L. C. Baker, who was absent in Texas when the fire occurred, was summoned and returned immediately, accompanied by Assistant Superintendent T. P. Cook, of Dallas, Texas. The daily papers were all loud in their praises of the remarkable phoenix-like feat of reconstruction and restoration accomplished by the Company. On Wednesday night the *Globe Democrat* was furnished with thirty thousand words of special dispatches, aside from the regular press reports of the news bureaus. Such service, under the circumstances, deserves the credit bestowed so liberally upon the Company by the newspapers. To the Chicago contingent, who labored faithfully day and night to get the Company's affairs in working order, is due a large measure of the credit the Company has received. For the able assistance rendered, the effective and speedy work accomplished, they merit the thanks of the Company and the St. Louis office as well. The present quarters have been as thoroughly and conveniently fitted up for the Company's use as was possible in the short time since the fire. The present office is undoubtedly temporary, and while the Company has not as yet decided upon a permanent location, a decision will no doubt soon be reached, and a better location and office will be secured. The third floor of the present quarters is occupied by the Wheatstone and Gold and Stock departments, the fourth floor by the multiplex instruments and switches, the fifth floor by the single wires and switch-boards. A system of pneumatic tubes connects the various floors and departments, and a speaking tube service has also been established between the several floors. The Company is thoroughly equipped for business, and since the day after the fire there has not been any noticeable delay in the transaction of the ordinary volume of business.

ST. LOUIS NOTES.—One very pleasant feature of the holiday season in which all were privileged to participate was the presentation to Superintendent L. C. Baker of a handsome double barreled breech-loading shot gun and hunting outfit, the gift of the operating department. The present was gratefully acknowledged by Col. Baker, who said that while he was generally opposed to such favors to officials, he could not but appreciate the courtesy shown him by the operators, especially as the gift was of a nature to be

highly prized by him. Chief operator Toppliff had the presentation in charge. An item in the last St. Louis letter in regard to the proposed (?) musical festival to be participated in by our local musical talent, has called forth considerable discussion as to who is "the McAneeny of St. Louis." With so many talented telegraphers capable of assuming this *role*, we can hardly hope for a speedy solution of the matter. The office can at least congratulate itself upon the abundance of this talent, and hope for the ultimate ascendancy of its true musical star. The success of organized social movements among the telegraph fraternity in other large cities should be an encouragement to the socially inclined telegraphers of St. Louis to inaugurate some scheme for the social and intellectual improvement of their own members. Let the matter be seriously discussed by all interested. Mr. Joseph Masker is still confined to his home, but with prospects of restoration to health and duty. A substantial Christmas present in the shape of a hundred dollar bill is sufficient evidence of the esteem in which the operators hold Mr. Masker. Operators Wilson and Parkinson have effected a change in the tricks, the former to the all-night force, the latter to the split trick; and operator J. H. Lowry, who has been under treatment at one of the city hospitals, has been removed to his home at Walker, Mo. Arrivals are: Harry Eckert and L. B. DeWitt, from brokers. Mr. S. A. Hawley, brother of chief M. A. Hawley of the Wheatstone, is a recent addition to that department from Chicago. Departures: J. H. Keown, to Kansas City; F. C. Wainwright, of Wheatstone department, to New York; J. G. Hogbin, formerly of this office is with the Mo. Pac. here, and operators George Morgan and C. Nowlen have been on the sick list for several days past. The "La Grippe" has asserted itself in this office. [The enterprising agent of the AGE, Mr. C. D. Lee, had photographs of the temporary telegraph office taken for reproduction in this journal. Unfortunately, however, they were ruined in the mails by becoming damp.]

CHICAGO NOTES.—The first month of the new year witnessed quite a number of changes in the Wheatstone department. Several of the young men were transferred to the "woods" in the Morse department, and others from the day to the night force. The profession, in the demise of Albert M. Coulter, which occurred recently in this city, loses one of its ablest men. Some time ago he came here from Titusville, Pa., where during the oil excitement he made quite an enviable record for good work. He was employed here by the postal. He leaves a wife and two children. Mr. E. L. McLaurin has been summoned to his home in Pontiac, Mich., because of the death of his father. Mr. E. W. Mayfield, who was sent to St. Louis to assist in the reconstruction of that office after the fire, has returned. Mr. Benjamin Johnson, an old operator, now one of the leading men with Salvini, the tragedian, paid this office a visit recently. Rumor has it that Mr. John Bell has signed with the Des Moines base ball club for next season, to guard first base. Mr. Richard Cogan has left to go to St. Louis for the Associated Press. We are happy to record the deserved promotion of Mr. Walter Stevely to the position of wire chief nights. Mr. Stevely is a gentleman of the first order, and of whom the entire craft should be proud. Messrs. Abrams and Hayes have returned from extended visits in Ohio. It is said Mr. W. H. Phillips has under consideration from the Carleton Opera Company an offer to sing during the coming summer season. Mr. Phillips possesses an excellent voice, and is a comedian of great merit. Mr. L. B. Pearson has gone to Portland, Oregon. Chief Harry Knight has been laid up for the past week with a severe attack of "la grippe," but is once again at his desk. Assistant night chief Crawford has been confined to his room several days by illness. On

February 9th, (Sunday) the election of officers of the Chicago Telegraphers' Aid Society will occur. The positions to be filled are president, vice president, secretary and treasurer. There are several candidates in the field, all good men and hard workers, and to whom belongs the credit of the present prosperous condition of the society. Johann Massen and Robert Drekeopf, of Germany, were recently guests of Mr. Duenwald, of this office.

MONTGOMERY, ALA., NOTES.—Business here has been quite heavy during the cotton season but is slightly decreasing now. We have one of the pleasantest offices in the South, and the force is first-class in every respect. Mr. F. E. Meyer presides as day chief, while Mr. R. T. Bishop takes care of the "night hawks." Our force is composed of the following operators: Days—C. L. Hall, J. E. Martin, M. A. Posey, B. P. Hancock, W. H. Jenkins and C. C. Prince. Nights—J. P. Higgins, C. A. Davis, W. B. Wright, G. E. Sornberger, and all night chief C. G. Zirkle. Messrs. Higgins, Wright and Sornberger alternate on report. Messrs. Bishops and Higgins are at the Cotton Exchange during the absence of Mr. Johnson, who has been on the sick list for some time. Several of the force recently called on Miss Lizzie Annandale, of the Emma Abbott Opera Company. She gave "her boys," (as she termed them) a very cordial welcome, and sends her "73" to the fraternity at large.

OTTAWA, ONT., NOTES.—At the W. U.—Mr. S. Jaques is chief here and looks after things in a satisfactory manner. Dave Robertson copies "A. P.," while Misses Cane and Farrell work Montreal duplex, and Miss Haryett, Toronto wire; Frank Turcotto, Fort Lawrence; M. McAllen and Miss Albright look after the business on back lines. At night we have Mr. E. M. Marshall as chief, who is quite a favorite among the boys, assisted by Wm. Hutchison, who copies Associated Press and Messrs. Lusted, Kains and Eggett handle Parliament report. The recent storm played havoc with our Western wires. All were pleased to see our chief back from a week's attack of "La Grippe." Business is picking up considerably since the opening of Parliament. Freddie Gliddon and W. A. Dier are the new arrivals who are working with the C. P. R. Our interests are ably looked after at Matawa by John Moran, who is well and favorably known in this district.

PHILADELPHIA NOTES.—Mr. Eves returned to duty at the Stock Exchange on January 27th after a six weeks' illness. Mr. John Sick is desirous of letting his friends know of the fourth addition to his family—a son—on the 22d.

INVITATION RECEIVED.—We are in receipt of an invitation from the Telegraphers' Mutual Aid and Literary Association, of Boston, Mass., to be present at the fifth annual ball which takes place February 14th. The ELECTRIC AGE will endeavor to be represented by one of its staff, if it is possible. Mr. Wm. A. Hazelboom, Secretary Committee of Arrangements, has our thanks for his kind invitation.

Halifax, N. S., has a Western Union telegraph office, a Great North-Western office, a Canadian Pacific office, a District Cable office, and before long the new Bermuda Cable will be landed at that point. Halifax before many years go by will be the landing place for all cables.

Mr. George E. Young, the well known Pittsburg telegrapher, has opened an electrical engineering establishment in that city, and is meeting with well deserved success.

J. T. Burgess, of the Anglo Cable Co., Canso, N. S., is now manager of the C. P. R. at Halifax, with Robert A. L. Watson, of North Sydney, chief operator.

Mr. D. T. Hiltz has been appointed manager of the Mutual Union office at Portland, Maine.

WESTERN UNION NOTES.—George Blood, Joseph Van Cura and Fred Ferris, three of the best men to be found in the service, have resigned to accept at greatly increased salaries positions with the Anglo-American Cable Company at 8 Wall street. The Cable Company is to be congratulated on having secured three such able operators and accomplished gentlemen. Mr. Gavigan, after an illness of two months with typhoid fever, has resumed work. Miss Nettie Alberts was married a few days ago to a well-known operator up town. Mr. John B. Sabine has obtained leave of absence for one month, during which his duties at the switch will devolve on Chiefs Meyer and Sheehan, who will work alternate nights. Much sympathy is expressed for Miss Saunders, who lost her father, and Miss Rebecca Taylor, whose mother died a few days ago. Cobweb Hullah is the way a sleepy operator on the First Chicago interpreted and transmitted the signature Callao Hubbell a few mornings since. It will no doubt be gratifying intelligence to those in Chicago who remember Tunis Fisher, who until the eventful summer of '83 was Chief in the Western Division, to hear that he is building up for himself a practice in the medical profession that is the envy of many older physicians. "I would very much like to get off to-day, Mr. Brennan," said a well-known operator after he had received his semi-monthly stipend. "In fact, it is quite necessary that I should." "I, too," replied Mr. B., "have wanted to get off on several pay days, but somehow I never could." Nothing daunted the applicant smiled audibly, arched his eyebrows cooly, shifted his quid noiselessly, rubbed his hands nervously—almost gleefully and then remarked: "Oh, that's all right, Mr. Brennan; you have given me the 'stiff;' now, then, please give me the off-slip." And rumor says he actually got what he asked for. Richard Powers, mention of whose illness appeared in a previous number of this journal, has returned to work. Oscar Berger has been absent considerably of late, owing to illness in the family. Happily, the members are all convalescent. It will be surprisingly strange if some of the operators here do not take a trip to Europe as a reward for the correct guess on the time it has taken Miss Nellie Bly of the *World* to make her tour. The interest manifested by the ladies appears to be contagious. Among the men it amounts to an epidemic, Mr. Les Bradley of the New Orleans quad, having no less than 170 guesses on file. Miss Ritie Gowan, after a severe encounter with the grip, has come off victorious and is again on duty. Rumor has it that a fourth loop to the *Herald* office is already being erected. Who the successful aspirant for the position in question will be is not now known. The all-absorbing topic of conversation now seems to be: "Are you going to the ball of the New York Telegraph Club on Feb. 3rd?" And judging from the manner in which the question is answered, the doors of the operating room will have to be closed to prevent some of the operators from being injured in the crush. Mr. Charles Swayze, who for some time past has worked the First Cincinnati, days, has changed places with Mr. Pat Carroll of the regular night force. Mrs. Mauer has returned to the City Department. Lon Bartholomew, who for two weeks past has been subbing for the New England Press man at Bridgeport, Conn., has returned to duty here. Miss Calvert of the City Department sailed for Scotland on Saturday last to spend a much-needed vacation. Quite a number of ladies are here engaged in writing prize stories for THE AGE. Mr. George Allman, for a long time employed as manager of the Telegraph Department of the New York *Tribune*, having resigned, Mr. John R. Powers has been appointed his successor. Mr. Ed. Brannin, chief operator of the Erie and New Jersey Divisions, has sustained a severe and very painful sprain of the ankle. Messrs. Adams and Morison, of the *Sun*, have returned from their respective homes in Canada greatly benefitted in health.

NEW YORK TELEGRAPH CLUB NOTES.—For the second time in less than a month the rooms of the New York Telegraph Club have been devastated by fire. Mention of the first conflagration occurred in a preceding number of this journal. On the morning of Jan. 21, at the hour of 7:14 the library, which after the first fire had been removed from the secretary's room to the card room adjoining the billiard room, for the purpose of enabling the carpenters, paper-hangers and other workmen employed to complete their labors in making habitable the rooms so hastily vacated, with the least possible inconvenience to the members, was so badly damaged that the contributions of Hon. James D. Reid, Andrew Carnegie, and others were almost entirely destroyed. One of the strangest facts in connection with this fire, and one, too, which was brought most forcibly to the notice of those who here witnessed the almost complete destruction of the property of the club, was the picture of our esteemed honorary member Geo. H. Usher, which, after passing through the first fire unscathed, passed through the second one without sustaining greater damage than the discoloration of a portion of the margin on which the picture was printed. In neither case was the glass injured, although on the last occasion in particular it was subjected to intense heat. It is the intention of the members to move to more commodious quarters as soon as they can be obtained. The loss is estimated at \$250; on which there is no insurance. The fire was unquestionably the work of an incendiary. Detectives now at work on the case hope to be able to report some very startling developments in a few days. The number of books lost by the fire is approximated by Librarian Powers at 100. Those who have contributed to the library books that are now known to be destroyed will, it is hoped, duplicate them as soon as possible. William Sanford, the faithful janitor, was remembered most handsomely on Christmas by the officers of the club. But then "Pop," as he is familiarly called, deserves all he got and more, too. The register book, containing the names of hundreds of visitors from all parts of both hemispheres was very fortunately saved from the conflagration. Thomas W. Greene has been elected chairman of the Governing Committee to fill the unexpired term of George W. Hann, absent from the city. The selection gives general satisfaction. Mr. David McAneny has very kindly consented to assume the somewhat onerous position of Director of the Glee Club. Mr. McAneny in this, as in everything he undertakes, is interested in the work before him; and should failure result it cannot be laid at his door. A string orchestra is one of the possibilities of the near future. A first, two second violins, a bass viol, two cornetists, and a pianist have already been obtained, and there is no reason why the club should not have one of the finest, if not the finest, band of its kind in the city. The probabilities now are that the annual reception of the club at the Central Opera House on the evening of Feb. 3d. will be very largely attended. No effort should be spared by the members to make this the grandest success of its kind witnessed this season.

OMAHA NOTES.—Several changes have taken place in our force since my last letter. Geo. Thompson has gone to Salt Lake, and Frank Deems to Council Bluffs, as report men; John Reed to Butte, Mont., and Joe O'Donnell to Denver, for the Denver & Rio Grande Railroad Company. Joe Adams has joined us again after about a year's absence, and nightly turns out his "copper plates." Joe is also working a bucket shop job, days. J. G. Seabrook has returned from an extended vacation spent in South Carolina. Mr. Todd, who was subbing for him, has left the town. Extra has been plenty lately, owing to the fact that la grippe has been getting in its work on the boys. About every man in the office is now or has been affected,

some quite seriously. Cralle, Potts and Pritchard are now on the sick list. Dave Bridwell is in bad shape with paralysis, but with great grit shows up at the office every day. A. M. Butler, who has been confined to his room with quite a serious attack of rheumatism for some weeks past, has resumed duties on the 5 p. m. till 12.30 a. m. trick, Jimmy Dion relieving him on the all-night trick. We were pleased with the receipt of a box of cigars a few mornings since from traffic chief Rushland, but still more pleased when we noticed the labelling of the box—"it's a boy and weighs a ton." Billy wears one continual smile these days. On Christmas the operators presented chief operator Twiford with an elegant gold watch and chain, as a mark of the esteem in which he is held by them. Superintendent Dickey made the presentation, and Mr. Twiford responded with a few well chosen remarks. Our worthy night chief, George W. Lloyd, was also the recipient of a little remembrance. The operators immediately under his charge presented him with a diamond pin. Mr. Lloyd also thanked his friends in the most cordial manner. Miss Lou. Miller, with the Postal at Sioux City, spent the holidays with friends in town. Miss Holbrook, of Denver, also gave us a call. Frank Moore, an old Omaha boy, and Matt Goff, late of St. Louis, are in town. The new year's issue of the AGE was a dandy, and we wish you every success for the new year. Many congratulations are being extended to Mr. William Lisk, who returned after an extensive honeymoon in the South. Mr. Grant Kinney, of Chicago, and Mr. Frank McKee, of this city, have exchanged places.

BOSTON NOTES.—Arrivals: Messrs. Whipple, Whiting, Thompson, Benelisha and Stetson; also Miss Minta Bishop, late of Milford, Mass. Miss Alden, of the city department, has cast her fortunes with the Postal. Mr. J. C. White, of the city department, is off on a vacation, his substitute being Mr. Whipple from the Postal. On account of the wreck at New London of the "City of Worcester," Messrs. Wolever and Pendergast were assigned there to help out. Mr. James Weir, of the Postal, formerly of this office, is the latest addition to the extra list. Frequent complaints are made of the smallness of the coat room. Our garments, in consequence, do not receive very good care. Hats, too, suffer unnecessary damage. We hope that Manager Henderson will be able to devise some means of adjusting the difficulty. A special notice cautioning operators against carelessness with regard to burnt matches, papers, etc., has been posted in a conspicuous place, and it is hoped it will be strictly observed by all. There is altogether too much laxity displayed in this regard. Preparations for the fifth annual ball of the Telegraphers' Aid Association is progressing rapidly. It is thought the affair will exceed in brilliancy even that of last year. As this is the only telegraphic event of the year, it is looked forward to with pleasant anticipation by all Boston telegraphers. Many of the lady operators will grace the occasion by their presence.

The following conversation reported from Boston is vouched for as having actually taken place:

St. Louis Operator to Bostonian (who has just received a lengthy special without a break)—"Say, you must be a fine operator."

Bostonian (with becoming modesty)—"Y-e-s—but how did you discern the fact?"

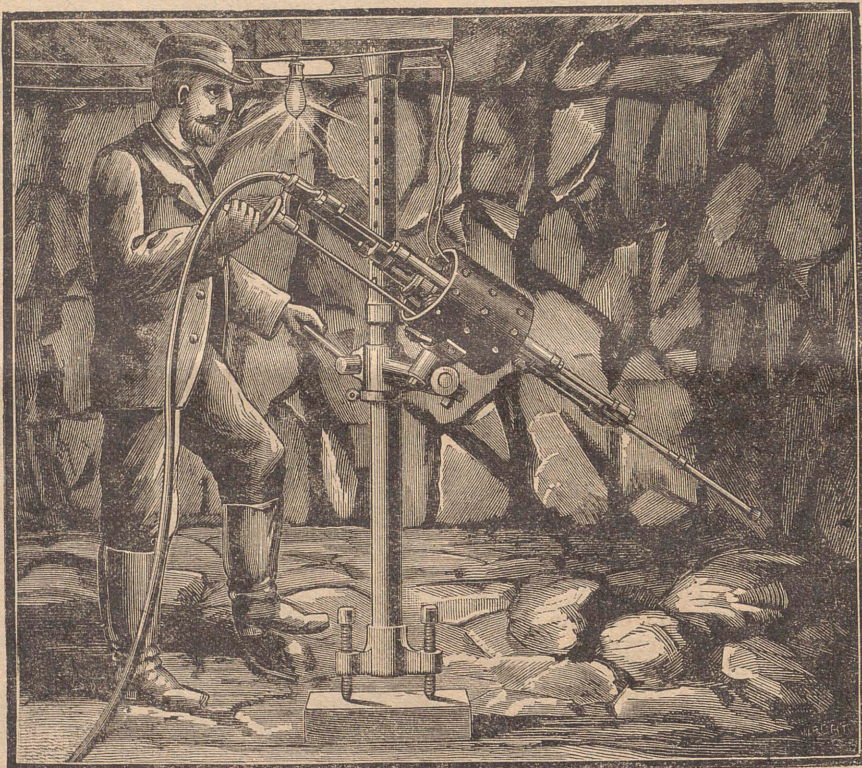
St. Louis Operator—"Oh! simply that distinguishing sense of discrimination peculiar to the St. Louis telegrapher enables me—" but the Boston man had been hypnotized, and the remainder of this remarkable contribution to modern literature was lost.

O. L. Ambrose, the night operator at Peach Springs, Arizona, who shot and killed C. W. Davis, the day operator at the same place, some time ago, has been arrested and is now in jail.

ELECTRIC ROTARY DIAMOND DRILL.

The accompanying view shows a new electric mining rotary drill which has shown very good results in experimental work, and which will soon be applied to regular mining work in several leading mines.

A good electric mining drill has always been desired by miners, and this drill seems to meet all the requirements. It is light, compact, simple and easy to operate. The motor is completely encased, so that it is impossible for dust, dirt or stray stones to lodge in the working parts. The whole drill is mounted on an adjustable frame, so that it can be very easily set in any position desired, or set at work at any part of the mine. The current for operating the drill is supplied at a constant voltage or potential; the number of volts depending on the potential used for transmitting power throughout the mine. If lamps are needed, they can be supplied with current from the same wires which supply current to the drill, and when in such use are connected in multiple arc across the main current wires.



ELECTRIC DRILL.

These drills are manufactured and sold by the Sprague Electric Railway and Motor Co. of New York, under patents granted to Mr. I. E. Storey. We understand that the Sprague Company is now at work on, and will soon be able to furnish a number of special mining applications, among which are an electric percussion drill.

PRODUCTS OF THE EDISON WORKS.—There were over 2,500 dynamos and motors manufactured at the Edison machine works, at Schenectady, during the year ending November 1st, 1889. At the Edison Lamp Company's factory at Harrison, N. J., between 7,000 and 8,000 lamps are produced a day. As many as 11,000 lamps can be turned out in one day in case of necessity. The United Edison Manufacturing Company has been reorganized, and is now working with a capital of \$1,000,000, \$500,000 of which has been paid up. The Canadian Edison Manufacturing Company has charge of the Edison manufacturing business, except the making of lamps, in Canada. Its shop is at Sherbrooke, near Quebec. The Sprague Electric Railway and Motor Company has at present in use 3,000 of its motors. The number of street railway cars equipped with electric motors during the last year by the company was 551.

THE INTERIOR ELECTRIC CONDUIT COMPANY.—Mr. Frank Kilton, inspector of the Buffalo Board of Fire Underwriters, states that he has examined the system of the Interior Electrical Conduit Company, and has made many tests as to the fireproof and waterproof qualities of their conduits. He approves and endorses it highly for use in his jurisdiction. The residence of Mr. Elihu Thomson, of the Thomson-Houston Company, is wired by the Interior Electrical Conduit Company's system, and in speaking of it Mr. Thomson says: "It is one of the best means of electrical wiring, and it has my full endorsement."

PHOTOGRAPHING RIFLE BULLETS.—Rifle bullets are now photographed in their course by means of the electric spark. The camera is taken into a dark room, which the bullet is caused to traverse. As it passes the camera it is made to interrupt an electric circuit and produce a spark which illuminates it for an instant and enables the impression to be taken. The wave of condensation in the air before the bullet and the rarefaction behind it are visible in the photograph, and can be studied by experts, thus enabling the form of ball or rifle which

ELECTRIC LIGHTING IN OMAHA.

The recently reorganized Thomson-Houston Electric Light Company is now engaged in the erection of a commodious and substantial power house at the foot of Jones street. The building is to be three stories in height, of brick and stone, supplied with every modern mechanical and electric convenience. There will be a battery of boilers for creating steam of a combined capacity of 2,400 horse-power. The boilers will be supplied with automatic stokers and other labor-saving inventions. Three ponderous engines will be set up, two of 500 horse-power each, and one of 200 horse power to commence with, with others to follow. Fourteen new dynamos for creating the electrical current have been ordered. They will be able to furnish power to small manufacturers having light machinery to run, such as sewing machines, small printing presses, machine shops, etc. Electrical motive power has proven a success in establishments requiring less than twenty horse-power. It is not only a success, but a great saving. An electrical motor takes up but a small amount of space in a manufacturing establishment. It dispenses with coal bins and licensed engineers, saves fuel bills and the salary of help necessary where steam engines are used. Omaha's city council has entered into a contract with the new Omaha Thomson-Houston Electric Light company to light the city by electricity. On February 15 the contract goes into effect and over 100 arc lights must be in operation. The company expects to be in readiness to comply with their part of the contract by February 1. To construct the circuits for street lighting, \$50,000 has been expended, and forty men have been busily employed and will be until everything is completed and in readiness to comply with the contract. Twenty-seven miles of wire will be used. The local Thomson-Houston company is backed by an abundance of Omaha and Boston capital. S. L. Wiley is president and general manager of the company, and Frank Warren secretary and treasurer.

THE FIRST TOWN LIGHTED BY ELECTRICITY.—At Kimberly the public lighting of the streets has been effected by means of arc lamps, which have been in continual operation for the past seven years, and it is somewhat extraordinary, but nevertheless a fact, that it should be left to a town in the heart of South Africa to be the first in the world to have its streets illuminated by electricity without previously having any other artificial light for this purpose. The nearest approach on record to this is the case of a town in Portugal, which is just about to make the transition from oil lamps to electricity for street lighting. Another interesting fact in connection with electric lighting at the Cape is that the introduction of the incandescent light in the private houses and warehouses within the docks at Cape Town was so rapid and complete, that in two years from the first electrical installation gas was entirely cut off from the main at the entrance to the docks.

A use of the telephone, which is very suggestive as pointing to future possibilities, is reported in an English paper. The parish clerk in a Norfolk village, being prevented by rheumatic gout from attending church, was presented by the manager of the local telephone company with a double telephone, which was fixed from the church to the old man's cottage, so that he and his wife could follow all the services. The old man is quite unable to hold anything, so the telephone is arranged so as to fit against both his ears. He can hear anything in the church quite clearly, and if a book is dropped or if any one coughs the sound is as distinctly heard as if he were in the building.

Phonograph parties are getting popular. It is a big advantage to be able to hand a windy guest a tube and let him fire away at one of the machines instead of into already overbored ears.

minimizes the resistance of the air to be selected.

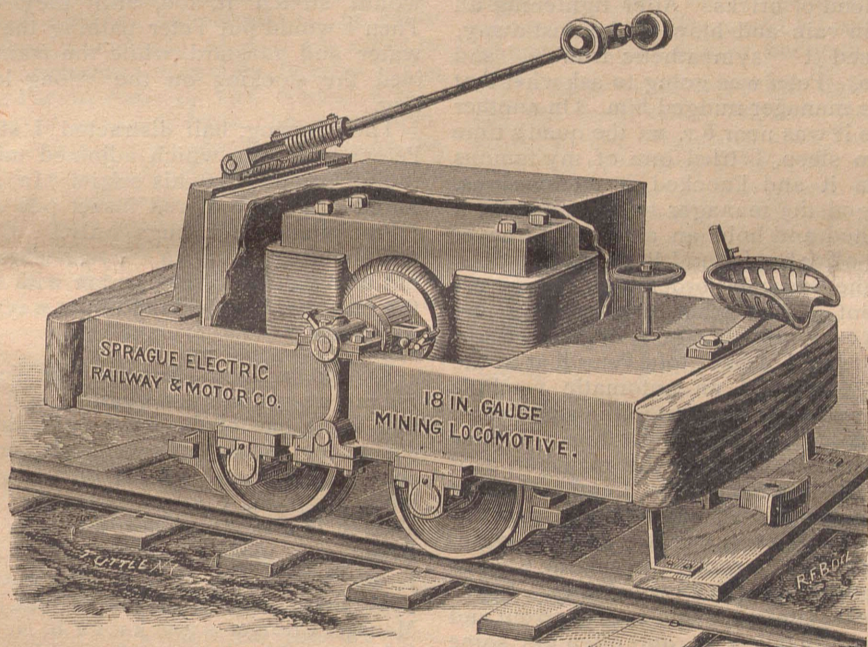
THE FRENCH TELEPHONES.—There is now, and has been since their acquisition by the State, considerable agitation regarding the French telephones and their working. The government has been almost overwhelmed with complaints, regarding which a French contemporary says: "Considerable discontent exists among the Parisian public, which at last sees that the question has been badly studied and badly understood, and that it is likely to become liable to feudalism, on account of the monopoly which has been demanded to satisfy State socialism."

A CABLE TO SAMOA.—It is reported from Berlin that German, American and Dutch bankers intend to lay a cable from San Francisco to Tutuillo, in Samoa. That would greatly promote the extension of cable service around the world, for it would hardly pay to stop at Samoa.

TELEPHONE ENTERPRISE.—The recent cyclone in St. Louis disabled 656 wires of the telephone company. By the aid of calcium lights the work of repair was prosecuted at night, and in 48 hours all damage was repaired.

ELECTRIC LOCOMOTIVE FOR METAL MINES.

We show in another part of this issue a view of a new electric rotary diamond drill manufactured by the Sprague Electric Railway and Motor Co. of New York, which has shown very gratifying results in the tests to which it has been put, and which promises to fulfil a long-felt want in electric mining. On this page we show another special electric mining application, *i. e.*, the electric locomotive. This locomotive is simple, powerful and compact, and is built with special reference to the arduous duties required of such a machine. The gauge of the locomotive is eighteen inches, but it can be accommodated to any gauge used in ordinary commercial work. In order to protect the machine from damage, all the working parts are completely boxed in, as shown in the view. The speed of the motor is under complete control by a switch which throws the winding of the field into different electrical combinations, thus varying the speed of the motor without the use of any wasteful resistance. The direction of rotation is also governed by the same switch, so that the operation of the motor is very simple, and it can be put in charge of an ordinary workman.



ELECTRIC MINE LOCOMOTIVE.

Any system of conveying the current from the dynamo to the locomotive can be used, either using the rails as one side of the circuit for the return of the current, or else employing a complete metallic circuit by the use of a double over-head trolley wire. In this latter case, a trolley pole, shown in the view, carrying at its upper end two trolley wheels for making running contact with the over-head wires is attached on the rear of the locomotive car.

This mining locomotive is now being manufactured by the Sprague Electric Railway and Motor Co. from designs made by Mr. I. E. Storey. One of the most noticeable advances made in modern mining science is the adoption of electricity as a medium for transmitting power and producing light, and such applications as the above indicate the growing demand of mining companies for just such apparatus, and the ability of the leading electric companies to supply the need.

In the Cape de la Hogue lighthouse in France a windmill is used to drive two dynamos, the current being stored up in accumulators.

The magnetic iron ore beds of Boyertown, Berks County, Pa., have been worked for about 125 years.

MICHIGAN ELECTRIC LIGHT ASSOCIATION.

SEVENTH STATE ORGANIZED.

A meeting of the companies doing business in the State of Michigan was held at the office of the Brush Electric Light Co., Detroit, Jan. 17th, for the purpose of organizing a State Association. The attendance and the response from companies throughout the State was good. The desirability of organizing such an Association was agreed to without dissent. The Association organized by adopting By-Laws and electing the following officers:

President, Geo. Peck, Pres. Edison Illuminating Co., Detroit; Vice-President, Jas. R. Dee, Gen'l Manager Peninsular Electric Light and Power Co. of Houghton & Hancock; Secretary and Treasurer, Jos. E. Lockwood, Gen'l Manager Brush Electric Light Co., Detroit. Executive Committee: Geo. Peck, Detroit; James R. Dee, Houghton; Jos. E. Lockwood, Detroit; W. H. Powers, Grand Rapids.

The Association will give its first attention to the establishing of a general system of rules and regulations for the wiring of buildings, so as to secure the safest and best construction and service.

THE ILLINOIS ELECTRIC LIGHTING ASSOCIATION.

THE EIGHTH STATE ORGANIZED.

A meeting of the representatives of Central Station Companies, called for the purpose of organizing a State Association, was held in the rooms of the Chicago Electric Club, Saturday, January 18th. The organization was effected by the adoption of a Constitution and the election of the following officers:

President, C. H. Wilmerding, Sec'y and Treas. Chicago Arc Light and Power Co.; 1st. Vice-President, A. L. Ide, Pres. Springfield Electric Light and Power Co.; 2nd Vice-President, Douglass Hapeman, Sec'y and Treas. Ottawa Electric Light and Power Co.; Secretary and Treasurer, Chas. E. Gregory, Sun Electric Light Co., Chicago. Executive Committee: C. H. Wilmerding, Chicago; A. L. Ide, Springfield; Douglass Hapeman, Ottawa; Chas. T. Page, Englewood; and M. A. Beal, Rockford.

COPPER MANUFACTURERS.—The American Copper Manufacturers' Association held their annual meeting on January 22d, at Delmonico's and ended the session with a banquet. Nothing of importance was transacted at the meeting.

The officers elected were: President—George A. Pope of the Baltimore Copper Smelting and Rolling Company; Vice President—Joshua Hendricks of Hendricks Brothers, of New York; Secretary and Treasurer—William H. Matthews of the New Bedford Copper Company.

EDISON LAMPS,

1/2 TO 36 CANDLE POWER.
2 1/2 TO 40 VOLTS.

FOR BATTERY OR DYNAMO.

These Lamps can be used in Series on Dynamo Circuits for all kinds of Decorations and Displays.

SEND FOR CATALOGUE OF LOW VOLT LAMPS.

EDISON LAMP CO., Harrison, N. J.

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A first-class Electric Light Plant in a growing town of 8,000 population. Best equipped plant in Wisconsin; well established; pay better than twelve per cent. Good reasons for selling. Cash only will buy it.

For particulars apply to

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62 South Canal Street, Chicago, Ill.

Mention this paper.

WANTED—Manufacturers to know that we will give free site, with right to purchase lands adjoining, to responsible manufacturers who will locate with us. The land is situated along the main line of Penna. Railroad, in Westmoreland County, Pa., 28 miles from Pittsburgh (all shipping rates same as Pgh.) in the heart of the Great Natural Gas Belt, adjacent to gas and water mains; is all underlaid with coal. Address
ENTERPRISE LAND COMPANY, GREENSBURG, PA.

J. B. SABINE,

COUNSELOR AT LAW.

Electrical Patents.

181 BROADWAY,

New York.

Specialty Electrical Patents.

THE PHONOGRAPH IN SAN FRANCISCO.—San Francisco seems to be taking the lead in the matter of putting the phonograph to novel uses. The latest story from that city is that some rich families are using the phonograph as a companion for the sick, a negro being hired to turn the crank while it sings, talks and plays. Some of the undertakers are about to employ it for short prayers and sermons at the burial of the friendless poor. Thus progress marches on hand in hand with business.

MY FIRST PATIENT.

BY JOSEPH HURLEY.

One traveling around the country drops into some queer telegraph offices. The most scantily-furnished one I ever struck was at a railroad depot in Baltimore City. Seeing a blue W. U. sign outside, I entered and found, what claimed to be the operator, standing at a high desk, with nothing on it but a file of sent messages. I inquired, in surprise, where his "trappings of woe"—the instruments—were. He answered tartly, that it made no difference, he would attend to my message. As I had only strolled in to ask for a job, I refused to give him my custom. He may perhaps have had a tube, or a telephone, concealed about his person, but I was too discomfited to look; and then, again, he may have stolen the sign.

There is a quadruplex in a small Western town that it would pay the company to remove and install a common file in its place. The town is a struggling one, and the telegraph office is running away behind the ticket.

I accepted the night position there solely to study medicine—and the salary. Had I known that the day operator wished the vacancy kept open until he became competent to fill it, I would probably have left it for him and gone herding sheep at the same pay. He overheard me telling the manager that I had worked in Pittsburgh and Minneapolis, and, straightway, upon his own responsibility, called up Pittsburgh, Ks. and Minneapolis, Ks., two small offices in the neighborhood, and asked them if they knew me; then reported to the manager that I was either under an assumed name or a liar.

During the first evening the manager stepped in ostensibly to see if the clock was there, and, incidentally, saw what time it was. And the day man (whom I will call Peter when I want him again) came in several times to ask my name. The latter, before leaving at six o'clock, filled the key points of the quad with ink, knowing that when I attempted to break, I would lose the report. Of course I did not discover this until press was over and I tried to say "good night" to the sender—it would have been the same if the President's message had come that night—but the spirit of the trick was mean nevertheless. When I went down in the morning for Peter's scalp, and stood over him undecided between a "pitch in" or a "tail-end collision," he looked up, and his naivete disarmed me. He thought I had been listening to his sending, and asked my opinion of it. I told him it was the "lightest comedy" I had ever heard; that it sounded like a sick hen walking over broken bottles.

About this quadruplex I will speak calmly, because it is two thousand miles distant, but I can recall scenes when I was on the point of balancing it with an axe. I will concede in a charitable spirit that it may have been put up wrong from the start, and that it was only a piece of machinery after all; but at that time I believed its contrariness and perversity were human, and I have diagnosed ailments in it that are only found in a man, a dog and a guinea-pig.

It would start out on a clear morning with what sounded like hiccoughs, by ten o'clock it would be shivering and shaking, and at noon be in spasms and convulsions. Anything we did seemed only to irritate it. We knew very little about quads between us. The manager confessed he knew nothing about them; I was non-committal, and Peter was out of the question. He knew nothing on any subject whatever, except what we told him. He used to forget and repeat back, like a phonograph, imagining things original that we had only spoken into him the day before. When alone and face to face with the instrument at night, I did not know as much about it as when it was simply under discussion in the day time, but I hit on a

novel and unique way to overcome the trouble. *I singled the wire.* This idea may not have been very brilliant and ingenious; still, it had never occurred to my predecessor, else he would not have filled the log-book with every phase of trouble known to electrical explorers, interjected here and there with cold oaths, written out and underlined. My one entry every night of "2 A. M. clear. No trouble with the quad," stood out in great contrast. I knew it was a reflection on him, but I only recorded the truth. I had no trouble with it; wanted no trouble with it; desired to copy press in a quiet manner, without any string band accompaniment, and, besides, I reasoned thus: if I close it up and not expose it to the night air, it may recuperate and get well. I often had to lock the door to guard the secret of my success. I never had said that I was an electrician. I was trying to be a doctor—but the manager got it into his head, from my appearance, that I was an electrician in disguise. I wonder if he thought I was copying press for my health?

I kept away from the office in the day time, but on several occasions a posse brought me in from where I was skulking in the suburbs to prescribe for the quad; on the first occasion I found it in a bad state, all run down—speaking through its common lung in a faint whisper, while the words were coming out of the polar lung like a load of bricks. After tightening all the screws in vain and blowing the dust away, I pronounced it "sympathetic trouble," and started to go. Peter was going to ask what that was, but the manager nudged him. On another occasion, as it was near 6 p. m., the quad's time for going to sleep, I tried one of my famous balances on it and knocked it unconscious. Then I begged the manager to let me take it out in the shed and hold an autopsy. I never entered that office but I found Peter making dots. I've heard the manager order him, in a severe tone, to "dot on the other side," get up and scrap with a customer, then go to dinner and forget all about him. I once told Peter that in the large offices they had an automatic machine where an operator put a cent in the slot and an arm would come out and dot for him. I knew he would not repeat this to the manager, as it might possibly be construed as a complaint. Of course business suffered, but it would also suffer if he was handling it. I now noticed symptoms in Peter that he wanted to ask me a question, but never had a good opportunity. I once read of a great statesman, who used to go out and pick up a fool to talk with, and often got some valuable points, so, somehow, I shunned Peter. At last it came; it was nothing—he wanted simply to know if the operators in the large offices balanced the condenser box on their knees as he did? I told him yes, but, actually, I thought there was something heavier weighing on him. About this time a strange bug appeared in the quadruplex. Nothing like it had ever been seen by the expert at the other end. It was a cross between the common "chinch" bug of the overland wires and the "20 minute locust" of 1870. Sometimes it would simply bite out a word and go. Again, it would eat out a whole signature and linger to watch the effect. Its ravages could be seen on the messages and customers. When it was about to fly away it would give a flutter and say, "C. U. agn," or "Be bk," or some cute little thing like that. We all tried to catch it, but failed.

I took another perfect balance, according to instructions sent me by letter from a friend, and ten minutes later Peter came with a pained countenance, stating that he was getting his own writing back. This was a new revenge. I listened, and tried to persuade him the sound he heard had no connection with his writing, but was the back stroke of a "Katydid" that I often heard at night on the quad. It was too thin; he knew his own combinations. So he continued to get his own writing back for the balance of the day. He said one day, "something 'hits' it," and, oh, how I wished it was a

pile-driver. One memorable evening when I arrived, the both of them stood over the quad dejected. I never saw so much trouble in ten sets—a whole plague of bugs had arrived. There was an electrical riot going on inside—a regular re-volt. The manager bet me the cigars I would get no press that evening, and that he and Peter would be back at 7. From this I believed they had done something to my patient, probably pulled the lynch-pin out, but I accepted the bet. They departed. I approached the window; they were gone. The sky was full of aurora borealis, just what I wanted, and, speaking a few words in Arabic to it, I approached the switch, made a few passes with plugs, and, lo, it singled. At 7 press was moving, but the door was locked—the manager had lost. I could not leave the press to let them in, and they were too mad to pass the cigars over the transom.

Next morning I was awakened with a peremptory note, saying the expert claimed he did not get our "short leg," and commanding me to tell them what to do. I replied to do nothing but dot until I got there, then turned over and went to sleep. The news that the thing had legs overcame me. On arising, I saw, if this was not a bull of Peter's it would necessitate an entire change of treatment. I would find that crippled "leg" or lose one of my own. I would stretch it, too, until they did get it. Then I would put Peter bathing the feet in hot water and mustard, while the manager examined the stocking on the "long leg" for the bug.

Thus musing, half distracted, I stepped into Peter's bedroom, which adjoined mine, hoping to find some clue to his origin. In a drawer I found a package of red insect powder labelled "Precipitancy for bugs only." Grabbing it, and shouting "Eureka," I rushed to the office, but was met by a messenger with a note that the manager had decided to put a type-writer in my place.

KNOXVILLE, TENN., NOTES.—The Western Union has just moved into new quarters, and the office is said to be one of the finest in the district. The equipment consists of two quads, two duplexes and six way wires, and the operating force is as follows: J. M. Creamer, manager; C. J. App, Geo. R. Walter, Jr., Thos. Broderick and J. H. Baxter, split trick; (nights,) L. A. Angel and J. J. Broderick. The clerical force is composed of T. A. Brady, Miss M. T. Lillard and John Callan. Manager Creamer is well known in New York and Baltimore. He placed all the multiplex machinery in position and arranged the office in such a satisfactory manner as to evoke unstinted praise from his superiors. We congratulate Mr. Creamer. The company has a wide-awake representative in that gentleman.

MEMPHIS DISTRICT MESSENGER CO.—In the January number of *The Great South* is given a description of the prominent business concerns of Memphis. Among them is mentioned the Memphis District Messenger Company, which is under the management of W. B. Harvey. This service is one of the institutions of Memphis.

The "Star" fountain pen, manufactured by J. Ullrich & Co, 106 and 108 Liberty street, is one of the best of this class of pens ever made. It is a very convenient pen to those who have occasion to require pen and ink at times and places where these cannot be obtained readily. The "Star" pen is finished in a first class manner, and has a deservedly large sale among telegraphers. The price of this pen is but \$1.50.

Dobson—These telegraph companies are rank monopolies. Only the other day a friend of mine paid \$10 for ten words.

Swan—That's nothing; it cost me \$100 for a single word one day last week.

Dobson—For heaven's sake, man, you don't say so?

Swan—Fact; my wife asked for a sealskin and I said "yes."—*Kearney Enterprise.*

TORONTO NOTES.—The Canadian Pacific Railway Company's line of telegraph was completed to Halifax on January 16th and that office is now open for business. The advent of the Canadian Pacific Railway telegraph was hailed with delight, not only by the business community but more especially by the Government and the press. Heretofore all Government official business has been under the control of the Western Union telegraph, which, during the fisheries dispute between the Dominion Government and the United States, might have been a matter of serious concern. The press news supplied to the Maritime Province papers has also been compiled in Boston, making the newspapers dependent upon American sources for not only their European but most of their Canadian news. The Imperial authorities here are also gratified at Halifax being placed in direct and instant communication with Vancouver and Victoria, B. C. The Canadian Pacific Railway line to Halifax was constructed under what must have seemed insurmountable difficulties. From Vanceboro, Me., to Halifax and New Glasgow, N. S., the Western Union Company, through controlling the right of way on the New Brunswick and Intercolonial Railways, hoped to prevent the completion of the line. The Canadian Pacific were, however, not to be beaten and their line was constructed immediately outside the railway fences. This necessitated getting the permission of every farmer along a distance of over 400 miles to erect the necessary telegraph fixtures. The Canadian Pacific Railway now control a continuous line of telegraph from Canso and Halifax on the Atlantic to Vancouver, B. C., on the Pacific and also to San Bernardino, 100 miles south of Los Angeles in Southern California, a distance of nearly 6000 miles.

MILWAUKEE NOTES.—We have not yet entirely covered from the Grip, but are getting there in great shape. With few exceptions the cases have been very mild, night chief Warth's being much the worst, he having been laid up about three weeks. Mr. A. Wilson, who in the regular order of things, has been promoted to fill the vacancy of all night chief, occasioned by the death of Mr. Granges, has been acting in Mr. Warth's place since the latter's illness, with much credit to himself and very agreeably to everybody else. J. Crotty who has for some time been suffering with heart trouble, has taken a trip South. Miss Mary Edgerton has taken her sister Mattie's place in the office, whose ill health has necessitated her withdrawal from the office. L. G. Grosh, who was sent to Oshkosh temporarily has returned. Mr. C. J. Cooke, operator of this city, left for Poughkeepsie, a few days ago.

C. P. R. EASTERN DIVISION NOTES.—Our highly esteemed superintendent, Mr. T. Hay, at Schreiber, was last Christmas Eve made the happy recipient of an elegant silver service and gold-headed cane accompanied by an elaborate address, presented to him by his employees on this division. Mr. Hay has been superintendent of this division for the past four years and this token of good-will and respect shows the high regard in which this gentleman is held by those whose interests he is ever promoting. Our popular young dispatcher, E. E. White, at Schreiber, has been transferred as well as some of the crews and power to the "Sault" branch where business is humming. A great number of the employees are suffering from the popular complaint, "La Grippe."

C. P. R. WESTERN DIVISION NOTES.—Mr. B. S. Jenkins, Superintendent of Telegraph at Winnipeg, was suddenly called East by the sudden death of his sister. J. Jackson of Kaministiquia, and W. H. Hallett of Lathom, spent their Christmas holidays in Port Arthur. B. W. Shaver, of Dexter, was away for the holidays. He was relieved by A. J. Purchase. The improvement in the AGE is viewed with much pleasure in this section.

JACKSON, TENN., NOTES.—Mr. Geo. Bleakney, well-known in New York and elsewhere, is located on the Mobile and Ohio road near this place. Mr. Len. Owen, of Atlanta, is visiting relatives here. S. W. Gibson, formerly of the Western Union, Nashville, has been appointed train dispatcher of the above road at Meridian. Mr. Robt. C. Jones, well known throughout the country in Western Union circles, has been made city passenger and ticket agent of the M. & O. at this place. The appointment is a good one.

PORTLAND, OREGON, NOTES.—Mr. Charles H. Crowell from Chicago is now chief operator of this office. Mr. Day, formerly day chief, has been made night chief. These changes are the result of much confusion and kicking—all hands taking part in making Superintendent Jayne's life miserable by petition and otherwise. Ill treatment was charged by the operators against the chiefs. Some five operators were discharged, but all were given excellent recommendations and then furnished positions at other points. Mr. Jaynes is to be congratulated upon acting in the manner he did, and the force feels satisfied that in Mr. Crowell an admirable chief operator will be found. Messrs. J. W. Laughlin, T. J. Gallagher and J. M. Spencer, three brilliant operators, who were let out, are doing excellent service at Helena, Mont. The night operators were compelled to count Associated Press and all contract matter, which contained figures, fractions, etc.

PITTSBURG NOTES.—A bright light went out on the 8th inst., when Minot B. Holmes, day receiver in the Western Union Telegraph office here died of typhoid fever. He was the son of Capt. R. D. Holmes, our veteran night receiver. His age was twenty years, ten of which had been spent in the service of the company here, in various positions from messenger up. His pleasant manner and obliging disposition made him a favorite with the general public as well as with all his associates, of whom Messrs. Clark, Wiley, Hunt, Chisholm, and Mr. George from the down-town office, and a number of operators attended the funeral on the 16th inst. The floral tributes were appropriate and elaborate. Cigars were plenty in "G" office on Friday morning, January 3d, and Thomas D. Williams, the genial chief operator, smiled blandly when asked the cause. "It's a boy." Mrs. A. A. Stuart, mother of George E. Stuart, assistant chief operator in "G" office, died of typhoid fever on Wednesday morning, January 8th, and was buried on Friday, January 16th. Mr. H. R. Swivell, of Newburgh, N. Y., has taken E. C. Painter's place at the Associated Press office. The latter gentleman was compelled to resign on account of ill health. He is now back in his old place as all night man in the Western Union.

DIED.

Miss Lillian M. Shannon, of 195 Broadway force, New York, died January 21 after a brief illness. Miss Shannon was a great favorite in the office, where she had grown up from a check girl.

Like the light of the sun
At the close of the day;
Like the dew and the mist
We are passing away.

When sunshine flees away it always leaves a shadow; and the bright, cheerful, happy face of sweet Lillie Shannon in passing away to join her mother, leaves a deep shadow on the many loving hearts which she had won by her innocent, childish ways. Motherless! Oh what a world of pathos and human misery there is in that word! Christmas morning she came to the office for the last time before her illness. She seemed very sad and told one of her girl friends that she could not feel happy on that glad day, because it reminded her of "mamma's death." Poor little heart-sore wanderer! She

is motherless no longer. Happy are they together in that dear refuge, where the houseless shall seek a shelter and the lonely shall find a Friend. We shall miss her greatly; and to-day smiling faces among us cover many sad hearts, which unite in beating a long, peaceful farewell to the tender, childish girl whom the Master called early, lest the cruel hand of the pitiless world should rest rudely upon her fair soul. Remember her, friends, as a dear, noble girl.

At his residence in Chicago, Ills., January 13, of heart trouble and influenza, Albert M. Coulter, aged 42 years. His remains were taken to Greensburg, Pa., for interment.

George F. McCrea, of the Postal force, 187 Broadway, New York, died of pneumonia at Bellevue Hospital, January 14, after an illness of one week. The entire force mourns the sudden taking off of this estimable young man. Mr. McCrea had just returned from Boston where he had gone to spend the holidays. His body was encased in a handsome casket and forwarded to St. Johnsbury, Vt., where his parents reside. A member of the force was detailed to accompany the remains to their last resting-place.

Wm. R. Batchelder, aged 37 years, a well-known New York telegrapher, died at his home in this city, January 30th. His skull was fractured by falling down stairs at his residence. He leaves a wife and one child. Mr. Batchelder was engaged as the New York representative of a Chicago broker for the past three years. He was at one time assistant chief operator of the Mutual Union's Chicago office. He was also employed by the Western Union at Chicago, Toledo, New York, and other points, all of which places he was well and favorably known. His relatives live in Chicago, where no doubt the interment will take place.

T. M. B. A.—Mr. D. C. Donohue representing the Telegraphers, Mutual Benefit Association, is canvassing the operating department at 195 for new members. This is a good field, and no doubt he will succeed in adding a number of names to the membership list.

AN OPINION OF THE ELECTRIC AGE.—Mr. John J. Seitz, of Hamilton, Ont., says: "Glad to see the AGE progress so well. It takes excellently here. Any one not satisfied with the paper will surely want the earth."

"That's all right enough, mom," said the messenger-boy to his mother, who was berating him for his laziness; "you don't know but what I'll lead the procession, yet."

Annual Reception
—OF THE—
NEW YORK TELEGRAPH CLUB,



CENTRAL OPERA HOUSE,
NEAR 67TH ST. AND 3D AVE., N. Y.
Monday Evening, February 3, 1890.
Tickets, Admitting Gentleman and Ladies, \$1.00
MUSIC BY BAYNE'S 69TH REGT. BAND. DANCING TO COMMENCE AT 9.30.

The new Central Opera House is the most beautifully equipped ball room in New York City. Accommodations of the highest order will be furnished the telegraphers of New York and vicinity, all of whom are cordially invited.

THE NEW EDISON-LALANDE BATTERY.

MANUFACTURED UNDER AUTHORITY OF

Thomas A. Edison,

Primary Batteries for Telegraph "Mains" and "Locals,"
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Electro-Medical Instruments, Annunciators
and Burglar Alarms, and all Classes of
Closed and Open Circuit Work.

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Fixtures Adapted to any System of Incandescent Lighting.

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AGENTS FOR OUR FIXTURES IN THE NORTHWEST.

JAMES D. REID TESTIMONIAL.—Among the many excellent testimonials received by Mr. James D. Reid from the ladies, before his departure for Scotland, was the following:

We hail thee, honored chieftain! Let thy brow
Be crowned with laurel wreath,—thy Country's meed,
In recognition of the loyal heart
And hand,—that weary not with worthy deeds.
From the warm shelter of our reverent love
'We send thee forth! In "hollow of His hand,
Neath shadow of His wing," thy home shall be.
What though fierce storms abound, and tempests rage
Thy barque wilt reach the Haven of His love!

When thoughts of home and absent friends are thine,
Look out upon the stars, and name them o'er;
The brightest and the best shall bear to thee
Our kindly thoughts, the incense of our prayers.
Thy mission hence accomplished, added gems
Will give new radiance to thy crown; and we
Will gladly welcome "Home again," the friend
Whose life inspires glad hopes of God and Heaven.

MRS. M. E. RANDOLPH,
(in behalf of the "Sisterhood.")

TORONTO NOTES.—The Canadian Pacific Railway's Telegraph Co. had a direct telegraphic communication from Halifax, on the Atlantic coast, to Portland, Oregon, via Vancouver, on the Pacific coast, a distance of about 5,000 miles. The mayors of each terminal point congratulated each other on the success of the completion of this extended circuit.

KILLED.—W. V. Morgan, manager Postal office, Hartford, Conn., was killed at the depot in that city, January 24, by being run over by the cars. Mr. Morgan was an excellent official, a devoted husband and an indulgent father. He leaves a wife and three children. Mr. Morgan was negotiating with an insurance company for a \$2,000 policy which had, however, not gone into effect.

SHOT.—A young man named Worrell, telegraph operator at Midville, on the Georgia Central Railroad, shot and fatally wounded Jesse Thompson, at that place, on the 25th of January. Thomp-

son is a prominent lumber dealer and manufacturer at Augusta.

CATARRH,

CATARRHAL DEAFNESS—HAY FEVER.

A NEW HOME TREATMENT.

Sufferers are not generally aware that these diseases are contagious, or that they are due to the presence of living parasites in the lining membrane of the nose and eustachian tubes. Microscopic research, however, has proved this to be a fact, and the result of this discovery is that a simple remedy has been formulated whereby catarrh, catarrhal deafness and hay fever are permanently cured in from one to three simple applications made at home by the patient once in two weeks.

N. B.—This treatment is not a snuff or an ointment; both have been discarded by reputable physicians as injurious. A pamphlet explaining this new treatment is sent free on receipt of stamp to pay postage, by A. H. Dixon & Son, 337 and 339 West King St., Toronto, Canada.—*Christian Advocate.*

Sufferers from Catarrhal troubles should carefully read the above.

The Telegraphers' Mutual Benefit Association.

A FRATERNAL LIFE INSURANCE SOCIETY.

—INSURANCE, \$1,000.—
TWENTY-THIRD YEAR.

For Particulars, Address THOMAS E. FLEMING, Secretary
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GOLD AND STOCK LIFE INSURANCE ASSOCIATION.

TWELFTH YEAR.

For Telegraphers and Others in Electrical Service.

INITIATION FEE, \$1.00. DUES, 50c per Month. INSURANCE, \$600.00.

In Payments of \$50.00 per Month for One Year.

WM. J. DEALY, Secretary,

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Will ship you any article in the way of Diamonds, Watches, Jewelry, Emblems, etc., etc., C. O. D. approval, and guarantees all goods as first-class, and prices spot cash, wholesale rates. We sell immense quantities of goods and can afford to give our customers the benefit of very great inducements. Write for Catalogue and our Co-operative Watch Club system. Manufacturing and Repairing. Designs furnished free of charge.

References: Editor of this journal and First National Bank, Chicago, Ills.

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Fountain Pens, \$1.50 and upwards



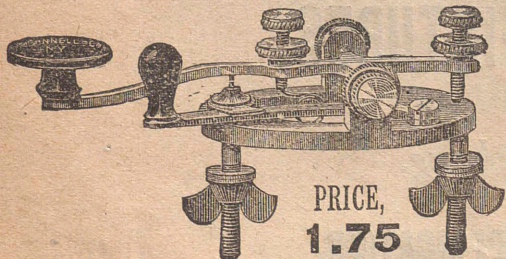
The FOUNTAIN PEN consists of a highly finished hard rubber holder, fitted with superior 14-kt. GOLD PEN to suit any writer.

"INDEPENDENT" STYLOGRAPHIC PEN. PRICE, \$1.00 AND UPWARD. EVERY PEN WARRANTED
Writes as smoothly as a Lead Pencil and is ALWAYS READY FOR USE.

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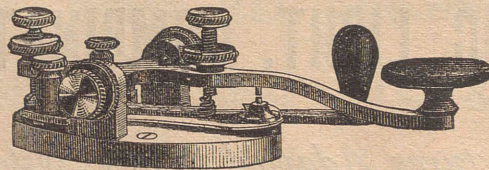


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Legless Pattern Steel Lever Key.

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.

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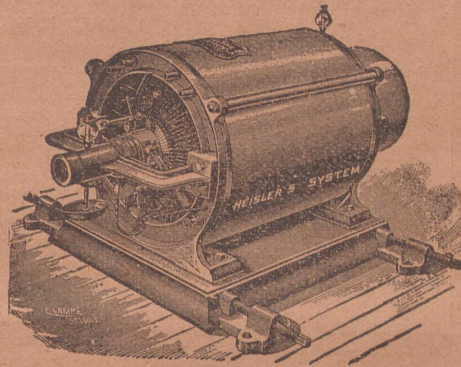
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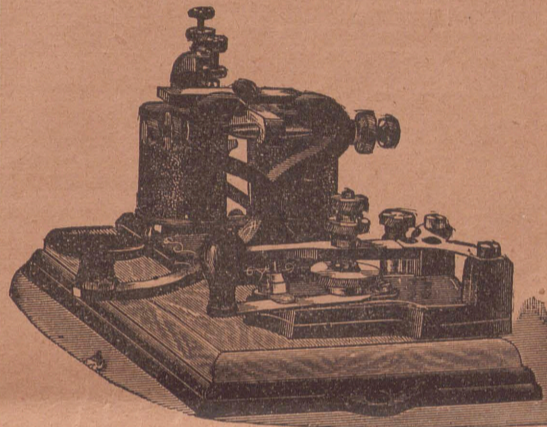
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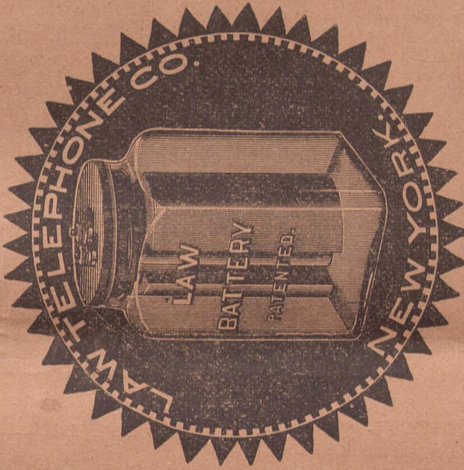
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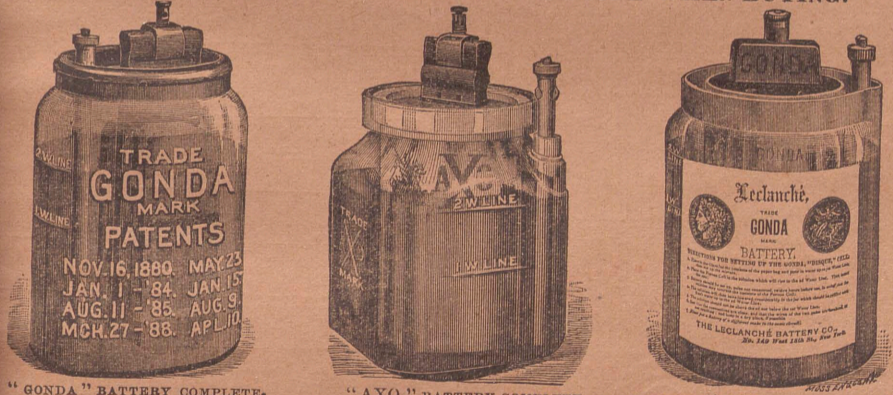
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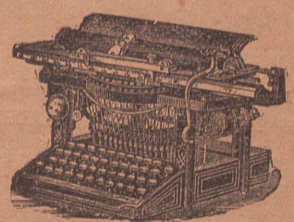
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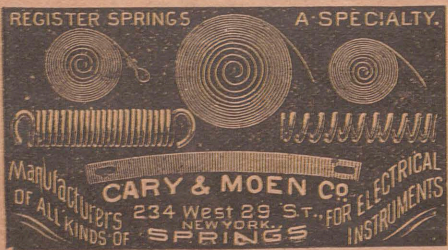
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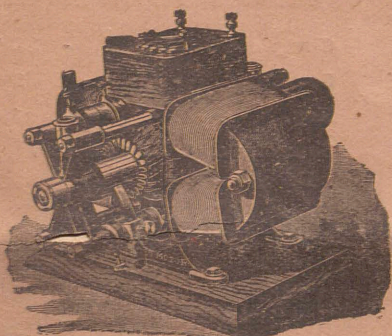
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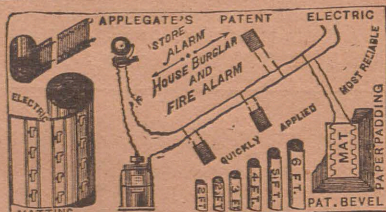
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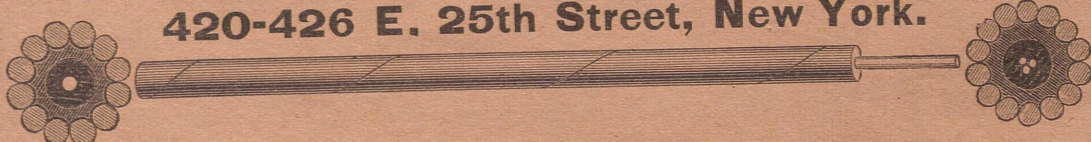


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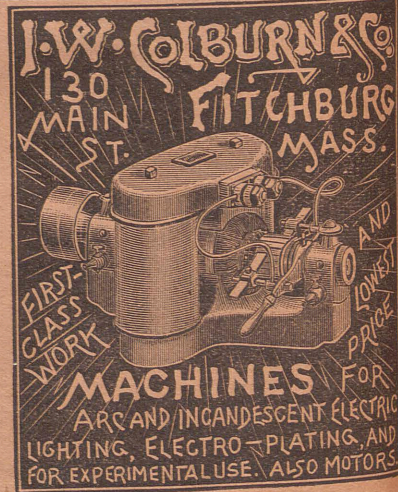
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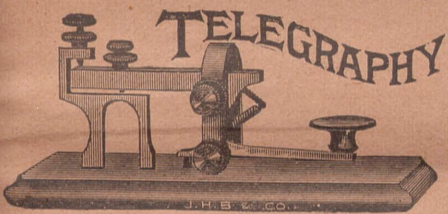
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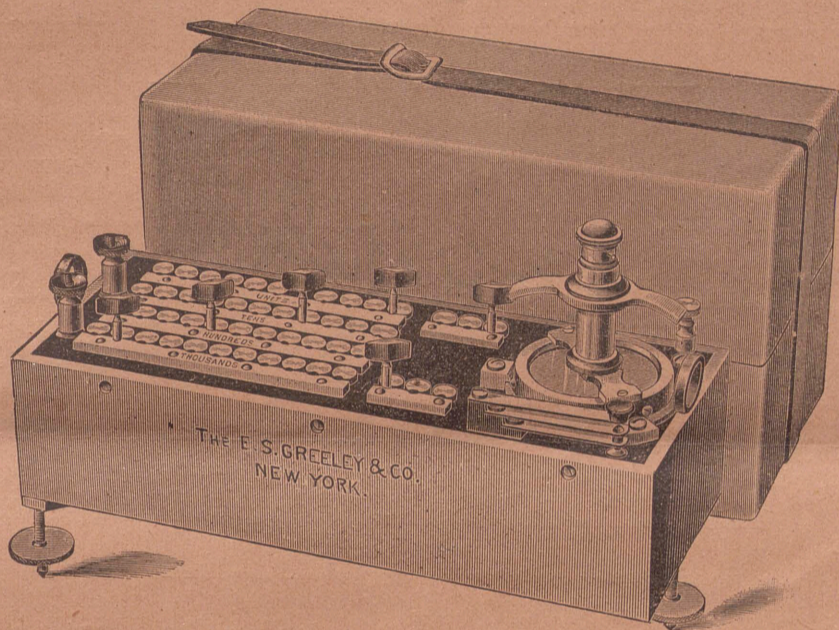
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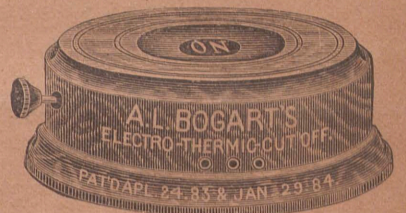
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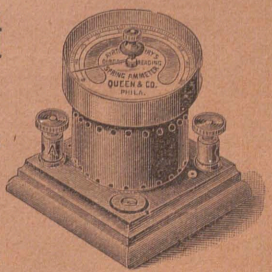
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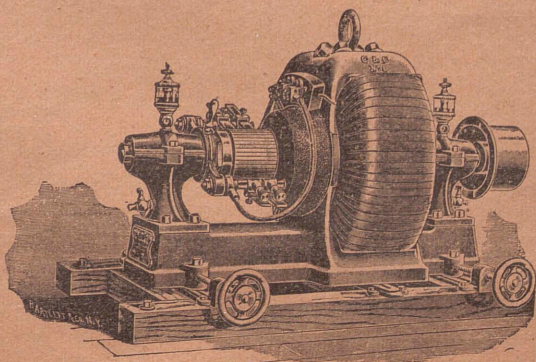
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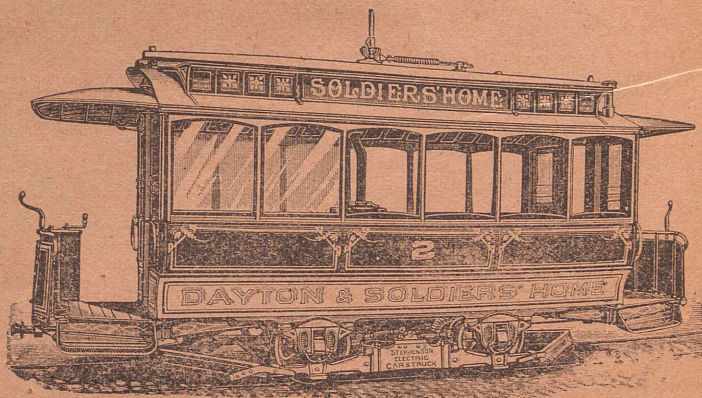
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 Campbellton, N. B.—J. Vautier.
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 Dayton, O.—W. C. Weinman.
 Dallas, Tex.—F. L. Saunders.
 Duluth, Minn.—E. D. Williams.
 Deming, N. Mex.—Mrs. M. E. Kaine.
 Erie, Pa.—Geo. J. Goadling.
 Evansville, Ind.—O. D. Richardson.
 Ft. Wayne, Ind.—J. H. Scherzgen.
 Hamilton, Ont.—J. J. Seitz.
 Helena, Mont.—B. F. Hartz.
 Jacksonville, Fla.—E. B. King.
 Kansas City, Mo.—B. C. Elder.
 Louisville, Ky.—F. Farrell.
 London, Ont.—D. Adams.
 Milwaukee.—A. P. Velle and L. C. Werle.
 Minneapolis.—B. W. Parrott.
 Memphis.—W. B. Harvey.
 New Orleans.—S. M. English.
 New Brunswick, N. J.—W. C. Wineland.
 North Sydney, C. B.—L. W. Hoyt.
 Newburg, N. Y.—John Mitchell.
 Newark, N. J.—E. A. Coney.
 New York.—H. I. Jolley, 195 Broadway.
 Pittsburgh.—W. E. Burns.
 Portland, Me.—K. W. Starbird.
 Philadelphia.—L. Miller and J. E. Janney.
 Petersburg, Va.—S. D. DeShazor.
 Plattsburg, N. Y.—G. W. Hickey.
 Port Arthur, Ont.—C. L. Hallett.
 Rochester, N. Y.—D. R. Hendricks.
 Reno, Nev.—E. A. Kilbourne.
 San Francisco, Cal.—H. M. Graham.
 Savannah, Ga.—G. W. Spaid.
 St. Louis.—C. D. Lee.
 Syracuse, N. Y.—S. H. Riker.
 St. Paul, Minn.—B. F. Wright.
 Toronto.—W. J. Anderson.
 Victoria, B. C.—Wm. Christie.
 Washington.—H. D. Robinson.
 Winnipeg, Man.—
 Wheeling, W. Va.—J. W. Wells.
 Watertown, N. Y.—F. B. Holcomb.

THE POSTAL TELEGRAPH SCHEME.

On another page will be found an outline of Postmaster-General Wanamaker's postal telegraph scheme.

According to his statement before the committee, Mr. Wanamaker does not seek to curtail any existing rights to any appreciable extent, but desires simply to combine post and telegraph on a basis that would offer incalculable service to classes not now enjoying the use of the telegraph to any large degree. According to the Postmaster-General's figures, less than 5 per cent. of the telegrams handled by the various companies in this country are of a social or private nature, while 85 or 90 per cent. are commercial and speculative. In Great Britain, he says, family and social business amounts to 50 per cent. of the whole.

He claims that the new plan would not lessen the business of any existing companies, but

would rather create a business of its own. The telegraphing under the new scheme is to be done by postal clerks, etc., who will be required to learn telegraphy, and probably to pass a civil service examination.

Mr. Wanamaker desires authority to secure a set of leased wires so that the "common people" may communicate through the post-offices from city to city, or by messages dropped in their mail boxes. Stamps are to be affixed to the telegrams after the manner of postage stamps, and any telegram properly stamped may be dropped in the nearest letter-box and taken to the post-office by the carrier for transmission by telegraph to its destination.

The only advantage of this scheme will be in possibly quicker transmission from post-office to post-office. The comparatively slow transportation by train will be avoided. The rates, of course, will be cheaper than they are on existing lines, but experience alone will demonstrate whether there will be much gain in time. If the idea takes well and business increases rapidly, the postal authorities, in large places particularly, may find their hands pretty full and delay in the transmission of telegrams may become unavoidable. Under such circumstances is it likely that the gain in time will be enough to offset the additional cost? For long distances it would seem that the advantage in the matter of time-saving would be in favor of the telegraph, but even then there will be a considerable element of uncertainty. This will arise from the fact that the wires are liable to be prostrated during stormy weather, or they may be overcrowded, and there are various other causes that may intervene and delay business. We presume the Postmaster-General has taken all these contingencies into consideration, but the fact that he is a capable business man in his own line does not necessarily imply that he can with the same ease pass upon questions that require technical knowledge. Matters pertaining to the telegraph business can be properly settled only by those who have devoted years of their lives to the service, and any one unfamiliar with all the technical details can, at best, get nothing more than a superficial idea of the subject, looking at it from a business standpoint.

In regard to the proposed method of supplying operators for this service, it seems to us impracticable. In order to perform the service efficiently, first-class operators should be employed. It takes years of experience to become a first-class operator, and comparatively few reach the standard. To launch a great undertaking like the one in question without trained help—the future operators beginning at the A B C of the profession—would be preposterous. The Postmaster-General would not want to discharge faithful and efficient postal clerks to make room for practical telegraph operators, who would be as unfamiliar with the postal service as the postal clerks were of telegraphy. Just how the Postmaster-General expects to overcome this difficulty is not apparent.

He speaks of the various colleges throughout the country turning out operators. Yes, they are turned out—turned out without the ability of earning their living at the trade they think they have been learning. If Mr. Wanamaker has his eye on telegraph colleges to draw on for operators, he will make a sad mistake, and we advise him to investigate the telegraph college question before he goes any further with his plans. It is a well-known fact that so-called "operators," graduated from "colleges," almost invariably are compelled to begin over again in their study of telegraphy, if they are persistent in their desire to become operators. All good operators acquire their training in a regular telegraph office, where they can enjoy the advantage of a regular business education, which can not be acquired outside of a telegraph office.

As to civil service examinations, we think the theory would not work well in practice. Many

first-class operators might be rejected simply because they could not tell how long the Congo River is, or the distance from San Francisco to Sitka, or some other distant point. If operators are to be employed from the outside, the effect of civil service examinations would be detrimental to the service, we think.

These are a few points that suggest themselves in considering the feasibility of the proposed plan, and we think that what we have said on the subject would be corroborated by any one familiar with telegraph affairs.

The Postmaster-General has evidently made up his mind to have postal telegraphy in some form, and we simply wish to point out a few obstacles that he certainly will encounter in the effort to attain his object.

PRIZE CONTEST.

Read our prize contest in another column. Liberal prizes are offered for a small amount of labor. We hope all our friends will make an effort to secure the first prize. All have an equal show, and the larger cities do not have any advantage over the smaller towns, for the reason that we have two, three and four agents in the larger places.

THE MESSENGER BOY.—"What is to become of the boy?" asks the *New York Tribune*, as it notes how the boy is being crowded out of occupations that used to be considered boys' work by elders of his sex, and girls. The messenger boy is being displaced by bearded men; the boy bootblack is giving way to older heads of the Italian race, and cash boys and newspaper boys are being to a great extent displaced by girls and women. Speaking of the messenger service, it would be a step in advance to let boys do that work. The "bearded men" are very inefficient messengers. They are, in many instances, physically incapable of performing the simple duties. That is not their fault, of course; they are to be pitied in their misfortunes. But it is the nature of a telegram to be rushed, and it should be put into the hands of the person to whom it is addressed with the least possible delay. There is nothing equal to a smart, spry boy to do this work. Give the boy a chance.

MRS. EDISON'S KIND ACT.—A pretty story is told of Mrs. Edison. On her return from abroad last summer she had in her employ a traveling companion, a Mme. de Meyer, who became ill some time after the conclusion of her engagement with Mrs. Edison. Although Mrs. Edison herself was suffering from the prevailing influenza, she visited her sick maid and had her taken to the seashore, in the hope of an early restoration to health. A nurse and a doctor were sent to Mme. de Meyer, and Mrs. Edison bore the entire expense. The whole affair was done in an unostentatious and delicate manner, and reflects the noble nature of the wife of the greatest inventor of the age.

HE LIKES THE PHONOGRAPH.—Erastus Wiman has come out as a champion of the phonograph and graphophone. This is what he poured into one of them the other day: "For an overworked business man like myself I consider that no greater boon could be furnished than to have beside him a silent but ever ready receptacle for what he has to dictate or say."

A MISNOMER.—A writer refers to the telegraph messenger as "a wing footed mercury." He must mean when the mercury is down pretty well towards the bulb.

THE OHM MEMORIAL.—The subscriptions toward raising a memorial to Ohm in Munich now amount to about \$6,000.

THE WHEATSTONE BRIDGE OR BALANCE.

This well-known apparatus is considered to be the most accurate, efficient and best adapted instrument extant for determining the locality of faults, and for ascertaining generally the electrical condition of all apparatus and circuits pertaining to a practical system of telegraphy. It is simple in its operation, does not require any special form of galvanometer (so long as it is sufficiently sensitive), is independent of variations in the testing battery, and possesses considerable range of measurement.

A theoretical representation of the bridge is shown in Fig. 2. It was originally constructed in this manner, but now usually bears the more compact and convenient form shown in plan by Fig. 1. The conductors *B C F G* (Fig. 2) are called the arms or sides of the bridge. The line to be measured usually forms part of the arm *F*, whilst the balancing resistances, comprising a series of coils from 1 to 4,000 units are placed in *G*. The arms *B* and *C* consist each of three coils of 10, 100, and 1,000 ohms respectively. A galvanometer and key are inserted between *D* and *E* for the purpose of determining when these two points are at the

(1.) Within the range of the coils in *G*: the arms *B* and *C* are made equal and approximating as nearly as possible the resistance to be measured.

(2.) Greater than that of the coils in *G*: the arm *C* is made less in resistance than *B*, and, conversely, when

(3.) The resistance to be measured is less than that in *G*: the resistance in *C* is made greater than that in *B*.

If the resistances in *B* and *C* are equal (Case 1), then by varying the resistance in *G* until a balance is obtained the resistance to be measured in *F* will be the same as that inserted in *G*. If *B* and *C* hold a known proportion to each other, such as 10 to 1, or 100 to 1, the resistance unplugged in *G* must either be multiplied or divided by that ratio as required, in order to find the value of the unknown resistance in *F*. Thus, in Case 2, *G* would have to be multiplied, and, in Case 3, divided by the ratios employed.

All parts of the practical arrangement of Fig. 1 will be found to correspond exactly with the theoretical arrangement of Fig. 2, and to be lettered homologously. The reversing switch *RS* and buttons *S* and *S'* are inserted for the purpose of illustrating and of facilitating the several changes to be made during the opera-

tests, and for the localization of faults, will be described in a future issue.

THE CLARK AUTOMATIC SAFETY DEVICE FOR HIGH TENSION WIRES.

The Clark Electric Company of this city have brought out a most ingenious automatic safety device for use on electric light wires. It is well known that when an electric light wire breaks the current continues to flow from the dynamo, and so long as it does the broken wire is a menace to life and property. Should the wire fall on a telegraph or telephone wire the instruments on such wire are burned out. Danger of fire is also a necessary accompaniment of an accident of this sort. If the wire falls into the street it is liable to cause serious, if not fatal injury to whoever happens to come in contact with it. Obviously any device calculated to remove these dangers in case of breakage of a wire would be of great value. Such is the object of the Clark device, and while it is very simple, mechanically and electrically considered, it is absolutely reliable and effective in its action.

The invention is of Ernest P. Clark, the electrician for the company, and that gentleman gave a practical exhibition of the working of the device recently to the representative of THE ELECTRIC AGE.

The Automatic Safety Device is made in three separate forms, to be applied to either series-wound arc lighting dynamos, shunt-wound arc lighting dynamos, or high tension alternating machines. In either case the action of the device and effect are the same. It is so constructed that at the instant the line wire breaks or is cut, the dynamo is rendered powerless, in which condition it remains until the circuit is repaired and the safety device is once more set.

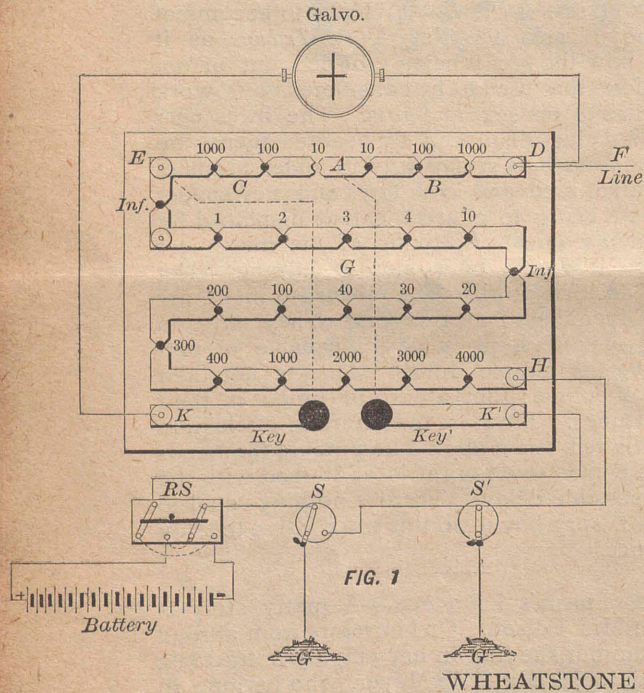
Another valuable feature of this arrangement is that it works automatically every time the dynamo is stopped or put out of action, and it must be re-set by hand, as the last thing to be done when starting the machine on its load. This in a measure insures its action, when it is called upon, for should it get damaged or out of order, the attention of the person in charge is called to it, as he must operate it every night in starting up.

The device is so quick in its action that before a broken wire has had time to pass through the space of one inch the current is cut off at the dynamo. The value of this feature can be readily appreciated when it is remembered that in many places electric light, telegraph and telephone wires are mixed indiscriminately on the same poles, and in case of the breakage of an electric light wire it does not have to fall far before it comes in contact with some other wire. But before the contact is made all the danger has passed away if the wire is equipped with this device.

The operation of the invention is absolutely reliable under all conditions, as was practically demonstrated on the occasion mentioned.

Taking it altogether, the Clark system of electric lighting is a very efficient one, and with the addition of this latest invention the company are placed in a position where they can say, "we have an absolutely safe system." To make this claim without qualification means a good deal.

In the Maryland State Senate on the 15th inst., a bill was introduced to regulate charges of telephone companies and to prevent discrimination. The bill fixes the rates to be charged between cities at fifteen cents for the first five minutes, and five cents for each five minutes thereafter. It also fixes the rental for one telephone at \$3 per month; for two or more, at \$2.50 per month.



WHEATSTONE BRIDGE.

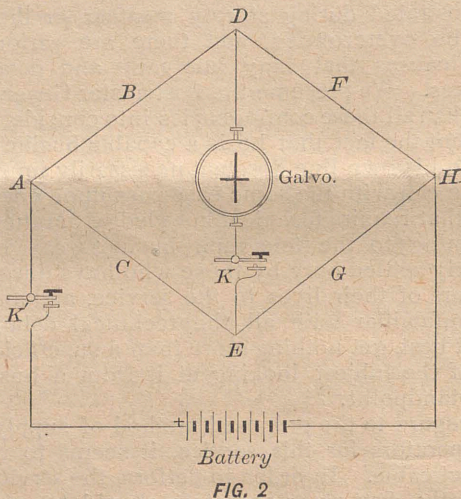


FIG. 2.

same potential, for it is in securing an equality of potentials by balancing one against the other that the principle of this system depends. A battery and key are inserted between *A* and *H*. When the key *K* is depressed the current leaving the battery divides into two parts when it arrives at *A*. One part goes via *B D F*, and the other via *C E G*, where they reunite and flow back to the battery. Upon examining these two branches it is found that the electric potential falls along either branch in exact proportion to the resistances encountered. If, therefore, the two routes are of equal resistance the fall of potential at all points along the upper route *B D F* will correspond with those points in resistance exactly opposite in the lower route *C E G*. Now, as a current cannot flow between two points where no difference of potential exists, it follows that under such circumstances no current will flow in the cross wire and galvanometer between *D* and *E*, or between any other points, such as *B* and *C*, or *F* and *G* equidistant in resistance from *A*. This will always happen when the four conductors *B C F G* hold among themselves the elements of a rule-of-three sum, or when $B : C :: F : G$, or $B : F :: C : G$.

To measure resistances :

ion of testing. The present arrangement of the apparatus shows the necessary connections requisite for an insulation test. The balancing rheostat *G* is connected at the post *H* with the ground through button *S'*. The positive end of the battery is also grounded through *RS* and *S*. The negative pole of the battery is led through *RS* to the right hand key *K'*, and thence through the dotted connection to *A*, when the key is depressed.

The battery current divides at this point, one portion going to ground by way of *C G H* and button *S'*, the other portion passing via *B D* to line *F*, the further extremity of which is open. It is absolutely necessary to have some resistance inserted in the arms *B C*, otherwise the galvanometer would not be effected; and it is usual in this test to make the proportions 1,000 on the line side as against 10 on the rheostat side, and multiply the reading of the rheostat by 100. By turning *RS* to the right the battery is reversed with regard to line and ground. When the buttons *S* and *S'* are moved to the right the rheostat is disconnected from the ground and placed in connection with one pole of the battery.

Some of the methods adopted and connections required for insulation and conductivity

BELTING FOR DYNAMOS.

BY CHAS. A. SCHIEREN, JR.

While electric lighting was yet in its infancy, it was found that the ordinary run of belting was unsuited for dynamo transmission. Belt makers began to study the requirements of electric light machinery, and found that a belt was needed which should be of a perfectly even substance throughout, combined with pliability and strength.

Many experiments were made in preparing these belts, both as to the quality of the leather used and improvements in the currying process. It was found that in consequence of the high rate of speed at which dynamos were run, and being exposed to mineral oil which penetrates the leather and rots the fibre, that the life of the belt was materially lessened. To overcome this difficulty a dressing or composition was invented, which, if put on the surface of the belt after it was made up, renders it im-

ions between the belt and pulley, consequently the dynamos could not be held up to their speed. After many experiments Mr. Schieren conceived the idea of simply perforating the belts with holes in a systematic manner, so as to produce a perfect tension and even strain all over the surface of the belt. A large machine was constructed which can perforate a belt of any width whatever, at the rate of one thousand feet per hour. (See fig. 12.)

This invention proved to be a great success, and during the past two years, thousands of these belts have been made by this firm, and are running in all parts of the country. They have been tested in various ways, and in the most difficult positions, and been subjected to the greatest strain, but have withstood all tests.

The Denver (Col.) Light, Heat & Power Company have twenty-one (21) perforated belts in operation. Some of them (sixteen inch) are running eight thousand feet per minute, developing one hundred and sixty horse power. They were put on the pulleys two and a half

is given in selecting the stock, we cheerfully extend an invitation to call and see our facilities.

OUR TELEGRAPH AND TELEPHONE SYSTEMS.

MM. de la Touanne and Seligman Lui, the two eminent French engineers sent to this country by their government to investigate the American telegraph and telephone systems, are astonished to see how extensive these means of communication are. In a recent interview Mr. Seligman Lui said: "The manner in which the telegraph and telephone, especially the former, is extended all over this country is astonishing. I regard the Western Union system as the best in the world, considering the difficulty it has to encounter. In Europe we only have telegraph stations where they are required, and many villages are without them. But here I have not seen a hamlet without a telegraph station, and in many instances I have seen stations on railroads where there was not a house for miles. Instead of waiting for a demand, the policy of the American telegraph seems to be to create it. The rates for long distances are low, but for shorter distances high, probably because of the indifference of Americans for small savings. Some points might be criticised; for instance, the mass of wires and unsightly poles in the streets of the largest cities. These would not be tolerated in Europe. I find that there is a strong feeling against underground conduits. As regard their danger, I can only say that they are used on the continent and that no bad results have followed."

MAKING ELECTRICITY SAFE.—The proper application of electricity to lighting and power purposes actually reduces the danger, both to property and life, concentrating as it does the primary force in one particular spot—the power station where the boilers and dynamos are located. If danger arises through its transmission, that is the fault primarily of the authorities in not regulating the manner of its distribution, and, in perhaps no less a degree, it is also the fault of the companies in not providing the safeguards with which they are perfectly familiar, and the necessity of which they well know. Explosions of illuminating gas and the ordinary hand lamp cause fires and death in far greater proportion to their use than does electricity. There was a time when electric railways were vigorously opposed because of the element of danger that accompanied them. Uncontrovertible statistics will show—taking street railways alone—that the cable system has caused more deaths in one week than has the more modern system in the whole period that it has been established. In fact there is no case on record, so far as known, where any one has been killed as a direct result of the application of electricity to street railways. In order to make electricity the safest form of force, it is only necessary to compel by law the use of safeguards that are amply provided. This is done in the use of steam and other forms of energy, and should be in the application of electricity, which is the most pliant, easily handled power that we possess.

ELECTRIC LOCOMOTIVES FOR LONDON.—The electric locomotives now being built for the City and Southwark Subway have, on trial, proved to be capable of moving the loaded trains at a speed of 25 miles an hour with ease, and a higher speed could be attained if desired.

LONDON'S POOR GAS.—There is great complaint in London of the poor quality of gas furnished to consumers, and the sentiment in favor of the electric light grows in inverse proportion.

The city trustees of Alameda, Cal., have decided to issue \$25,000 worth of electric light bonds.

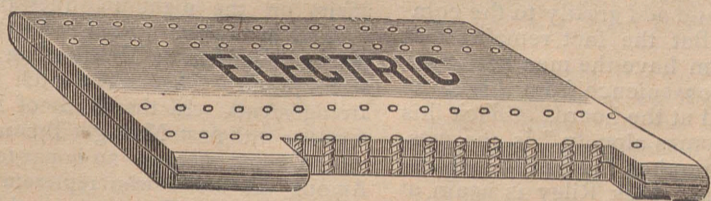
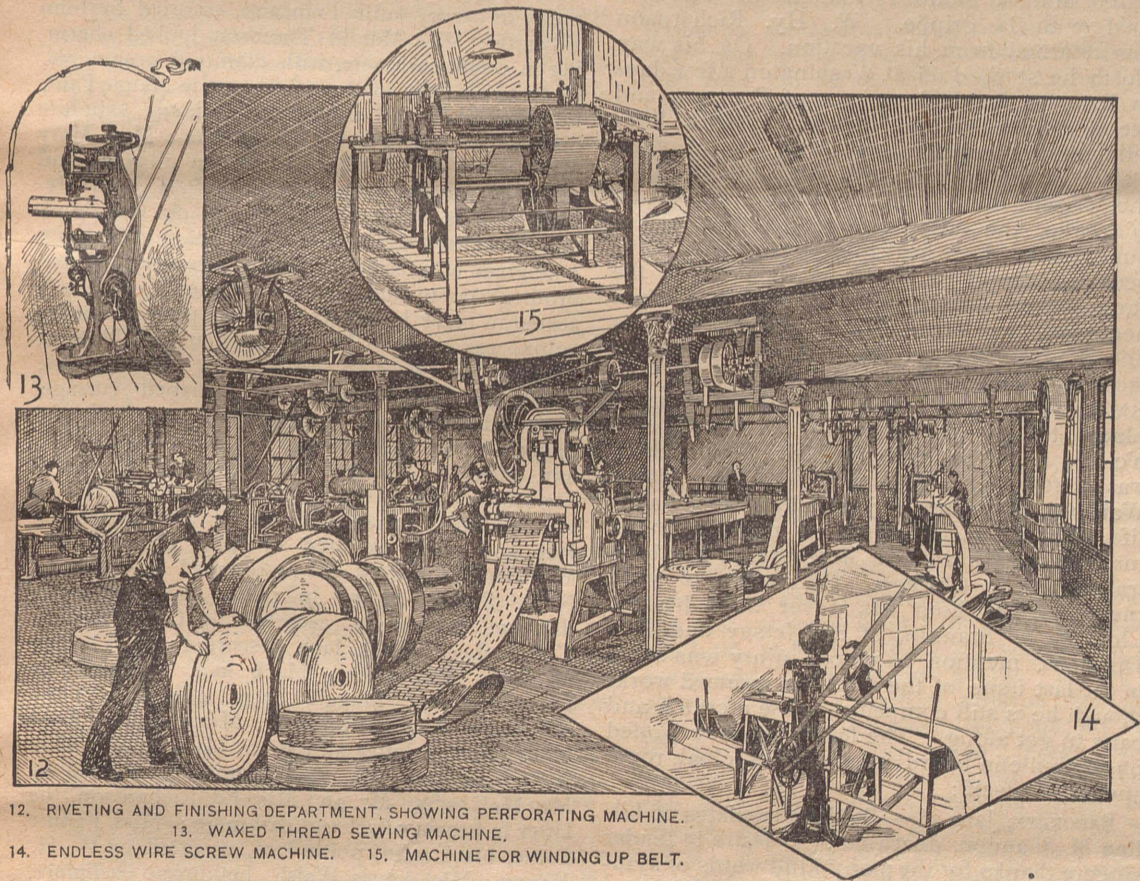


FIG. 11.



12. RIVETING AND FINISHING DEPARTMENT, SHOWING PERFORATING MACHINE.

13. WAXED THREAD SEWING MACHINE.

14. ENDLESS WIRE SCREW MACHINE. 15. MACHINE FOR WINDING UP BELT.

pervious to all oils or any liquids of any kind, and makes the belt as near waterproof as leather can be made. This dressing is what makes the life of Schieren's "electric" belt at least four times that of an ordinary belt.

It was also found that the rivets or fastenings generally used were too cumbersome, and injured the running of a dynamo belt. To overcome this, the house adopted the method of using *endless copper wire screws*, which are screwed into the belt and cut off short at both ends, leaving the surface perfectly smooth and at the same time holding the leather firmly together. (See figs. 11 and 14.)

When the alternating current system made its appearance and belts had to be run as high as ten thousand feet per minute, it was found that many belts would not stay on the pulleys at all, and if they did stay on would run with a sort of waving, vibrating motion, and form air cush-

years ago, and are apparently as good to-day as when put on. The perforations in these belts besides preventing air cushions from forming between belt and pulley, allow them to be run looser than ordinary belts with less strain on dynamo bearings and the consequent use of less oil.

In order to insure success and avoid any possible cause for failure, the firm uses nothing but the centre part of prime steer hides in making up these belts. The leather is all pure oak tanned, stretched on the latest and most improved plan, and anything that can be done to still further improve the quality of these belts, is done irrespective of expense, in order to retain the high standing which they now have in the market, and to make the quality still better if possible.

To all those who are interested and desire to see how electric belts are made, and what care

THE FAST SENDING TOURNAMENT.

In addition to the subscriptions already received for the National Fast Telegraphing Tournament, the Western Union Telegraph Company and its general manager have placed themselves on the list in a manner deserving of public and detailed announcement, the matter being of especial interest to the craft. The following is the correspondence:

GEN. THOS. T. ECKERT, V. P. and G. M.

Dear General:—Arrangements are being made for a National Fast-Telegraphing Tournament, to take place in this city in April next.

The United Press, Associated Press, the E. S. Greeley & Co., J. H. Bunnell & Co., Western Electric Company, *Electrical World* and THE ELECTRIC AGE have given me assurances of substantial support. These contests are far-reaching in the matter of elevating the standard of the profession; consequently, a direct benefit to telegraph companies.

May I count upon the co-operation of our company?

Very respectfully yours,
FRED. CATLIN,
Manager Nat. Fast Tel. Tournament.

EXECUTIVE OFFICE W. U. TEL. CO.,
NEW YORK, February 11.

FRED. CATLIN, ESQ., Manager Tel. Tournament.

Dear Mr. Catlin:—Your notes of January 20th and 29th were duly received, and I regret that my answer has been delayed by an illness which has kept me away from the office, and the subsequent rush of business upon my return.

It gives me pleasure to send you herewith a check for one hundred dollars as the company's contribution to the prizes to be competed for, and to add thereto my own check for twenty-five dollars. I need not say to you, and through you to the operators generally, that I take a great interest in the tournament, which will show flattering evidences of their skill, and of the possible achievements of the best equipped men on the lines.

I hope that the tournament will be in every way a great success, and that the best man may win.

Yours very truly,
THOS. T. ECKERT,
V. P. and General Manager.

195 BROADWAY,
NEW YORK, February 11.

THOS. T. ECKERT, V. P. and General Manager.

Dear General:—With sincere thanks I hereby acknowledge receipt of check for one hundred dollars, a contribution from our company, to be added to the tournament prizes; also your personal check for twenty-five dollars for the same purpose. Still more than these do I value your expressions of cheerful co-operation in, and hearty sympathy with the affair, and in this feeling I know I voice the sentiment of the fraternity throughout the country. I trust the result of the contest will fully justify your expectations.

Yours very truly,
FRED. CATLIN,
Manager Nat. Fast Tel. Tournament.

It has been suggested that a prize be offered to operators who were in the service prior to 1865, as it would give some of the old timers a chance to show how well they have maintained their grip. A prize will probably be offered.

It is to be hoped that other cities will be represented in this national tournament. Local tournaments can be held and selections of representatives decided upon, and there should be no difficulty in securing free transportation to come in such capacity.

Co-operation and substantial aid are assured from the management of the Postal Telegraph Company, who are in hearty sympathy with the movement.

NEW YORK WESTERN UNION NOTES.—The fast-sending tournament to be held in this city in April is just now the subject of no little discus-

sion. Everything points to the success of the affair, and a much larger number than has ever witnessed a similar contest will unquestionably be present. "The suggestion has been made," said Mr. Catlin to your correspondent a few days ago, "that holding a preliminary contest now for 1892 was reaching too far ahead. The coming national tournament will be held in New York in April, and will have no direct bearing upon the proposed international tourney, except inasmuch as it will help to locate and bring out our best talent, and give us possibly new records, which may be again cut down by growing ambition and additional efforts in 1891."

Unless something be done to stop the draught from behind the main switch it looks as if every chief there employed would, before the winter is over, be down with a cold. Of that even now most of them are suffering, but it has not yet developed to a sufficient degree to be characterized as serious. Such of the storm windows as have been put in are excellent preventives from draughts and add greatly to the comfort of the room. But the fact remains that nowhere in the room have the men been subjected to greater inconvenience from this cause than those employed at the board. "Back this bed express to-day comes already," is the message a German telegraphed his family in Newark a few days since. Jack Riley is again at work after a month's residence in the hospital with la grippe. W. Hy. Richardson has returned from his vacation. On his way North he stopped off at Washington a few days to listen to the deliberations of Congress and see a number of old friends. Charles Bouteille, of the regular day force, has changed off for a few weeks with Mr. Rockwell, of the night force. J. C. Kelly and Hugh O'Rourke, the latter one of the most expert punchers in the Wheatstone department, have been transferred to St. Louis to perform the same service there. Mr. O'Rourke will, when necessary, work the Morse system. He is one of the brightest as well as one of the most capable young men in the service. John Rathbone, Jr., and Frank Burger have changed places, the former coming on at 6 instead of 8 o'clock A. M., as formerly. Mr. Walter Brant was a few days ago married to Miss Hattie Watson. May they enjoy a long and happy life. Mr. C. H. Byington, a popular young man in the Wheatstone department, has been transferred to Chicago. His record of sixty messages per hour has never been beaten. Chief E. E. Brannin, of the Jersey and Erie Divisions, mention of whose injury was made in the last issue of the AGE, has resumed work, though he is still compelled to use a crutch and cane to get along. The following letter posted on the bulletin board in the ladies' cloak room speaks for itself:

BROOKLYN, Jan. 26.—To the associates of Lillian M. Shannon, deceased: I desire to tender sincere thanks for the many kind words of sympathy, the tender expressions of love for her and the liberal offerings from her associates of 195 Broadway on the sad occasion of the death of my daughter. Words can convey but a shadow of the gratitude I entertain for them, and while I live I shall ever hold sacred their memory. Very respectfully,

ROBERT SHANNON.

"Offer a prize for cable operators" reads a dispatch recently received by Mr. Catlin. "I want to send from the bottom of the sea—Dan McGinty."

The dispatch, which was paid for, came over the Postal lines. "As Dan doesn't say what cable he will cut in on," said Mr. Catlin, "and as I don't know where to reach him, I am afraid I cannot arrange this."

Telegraphic communication between Lewes and the Delaware Breakwater has been restored by the laying of a new and heavier cable.

THE N. Y. TELEGRAPH CLUB RECEPTION.—Nearly, if not quite, 200 couple either tripped or witnessed the light fantastic on the floor of the Grand Central Opera House, Sixty-seventh street near Third avenue, on the evening of the 3d inst., the occasion being the first annual ball of the New York Telegraph Club. The affair was a grand success. Never before at a gathering of telegraphers in this city has a finer array of toilets been worn. The club, which has for its objects sociability, athletics, etc., is officered by the following named gentlemen, most of whom were present: Geo. E. Holbrook, president; George W. Hann, first vice president; Conrad Meyer, second vice-president; Thomas W. Greene, third vice-president; James Clayton Watts, recording secretary; Edwin Dean, financial secretary; James J. Buxton, Treasurer; J. R. Powers, librarian, and a Board of Audit composed of Paul Sheehan, chairman; Dr. Byrnes and N. D. Webster. To J. Clayton Watts, secretary of the club and chairman of the committee of arrangements, great credit is due for the very able manner in which he conducted the affairs on the night in question. Everything worked smoothly. R. C. McDonald as floor manager, assisted by Mr. Joe Van Cura, did themselves proud. There was a hitch nowhere in their arrangements. In the words of Mr. Dealy, who together with Asst. Manager Brennan, was present: "It's a grand success—an honor to the fraternity." Among the ladies who represented the "Postal" were Miss Bessie Thompson, looking piquant and pretty in canary faille Francaise, escorted by John Edwards; Miss Mamie Thomson looked charming in cream cashmere, with diamond ornaments, escorted by Edward Reynolds; petite Mamie Paul, becomingly dressed in blue and pink silk, sapphire ornaments, escorted by her brother; Miss Mary McDonnell, richly attired in cream albatross and ribbons, pearl ornaments, escorted by John McNally; Miss Julia Commerce, black lace, pink tips, escorted by Charles Ruffer; Annie Conway, Nile green silk, silver trimming, escorted by her brother; petite and vivacious Sadie W. Fellgraff, attired in black lace, velvet bodice, pearl ornamentation, was escorted by the popular Jack Powers, librarian of the club. Charming Mrs. Fones, richly attired in black lace, V-shaped corsage, diamond ornaments, was one of the most graceful dancers on the floor and she was chaperoned by Mr. and Mrs. E. F. Burt, of Brooklyn, the latter handsomely attired in cream crepe de Chine, lace and diamond ornaments; Carrie Macy, in black lace and satin, escorted by John Dugan. The Western Union force was represented by charming Nellie Reeves, attired in yellow lace and satin, diamond ornaments, escorted by Chas. Power; Tessie Lee, black lace, escorted by Thomas Moffatt; Jennie Lee, black lace, escorted by Howard Parry; Maggie Barry, attired in white silk, escorted by her brother; Mr. and Mrs. Fred McCrum, the latter attired in black lace; Miss Scott, lilac surah silk, violet trimming, escorted by Mr. McKowin; Mr. and Mrs. Ed. Richardson, the latter in brown velvet and cashmere; Miss Fannie Paine, black satin, point lace, escorted by W. H. Young; Miss Agnes Walsh, heliotrope cashmere, diamond ornaments, escorted by her brother; Mr. and Mrs. R. L. Lynch, the latter attired in black silk and red net; a fair incognito in blue silk and lace was escorted by Sanford M. Fones; Mr. and Mrs. Frank Howell, the latter in black satin, jet trimming; Mr. and Mrs. J. I. Baxton, the latter in brown silk, diamond ornaments; Mr. and Mrs. F. C. Halstead, the latter attired in black satin, jet and diamond ornaments; Miss May Willetts, in cream satin, escorted by Wm. Davis; Mr. and Mrs. Harry Dusouchet, the latter in black silk; Mr. and Mrs. Thos. F. Greene, the latter in brown silk and velvet; Mamie Newman, in pink cashmere and silk, escorted by Charles Obst; Mamie Halpin, in cream cashmere, escorted by W. H. Newman; Mr. and Mrs. Louis Kirschbaum, the latter in black satin and lace; Miss Grace Hamilton, black lace, escorted by B. F. DaCosta; Lizzie Curtis, in black silk and lace, escorted by Matt Nolan; Mrs. Castellanos, in cream cashmere, escorted by her father; Miss White, in cream satin, escorted by her brother, Ed. F. White.

ENTERTAINMENTS AND RECEPTIONS.

Many of the Western Union (195 Broadway) force are members of the Phoenix Club, a Brooklyn affair which consists of some fifty telegraphers residing in the upper part of Brooklyn, and whose houses are connected with each other by wire. The Club has also connection and agreements with the telegraph offices so that its members can send and receive messages to and from any part of the country without leaving their rooms. A clock strikes the hour regularly and chess is played by the members, the moves being demonstrated over the wire; and similar inventions tend to make the thing, as a whole, a source of amusement rarely seen in connection with any of the more popular clubs of the city.

The club gave a very enjoyable entertainment and reception on January 30, which was well attended and appreciated by the members and their numerous friends.

After the excellent entertainment, which lasted until 11 o'clock, the younger people inaugurated a three hour season of dancing.

The committee of arrangements consisted of Frank H. Briggs, chairman; W. W. Walsh, Fred J. Dixon, Frank L. Catlin and Verd Knittle; reception committee, Wm. E. Fisk, J. E. Rohrer, Chas. Cox, Thos. Gendar, M. Leggett and A. Levigne.

The Brooklyn telegraphers last year formed a social club which was appropriately christened "The Electric Club." This organization gave an entertainment and reception January 31st in the main hall of the Johnston Building. There was a good attendance, and the affair, which is the second of the kind given by the club since its organization, was pronounced a great success.

The entertainment began shortly after eight o'clock, the programme consisting mostly of musical parts. This was as follows, many of the performers receiving encores:

Hungarian Dances.....	Orpheus Quartet
Recitation—"The Burglar's Story,".....	M. J. Phelan
Piano Solo—"Overture to Fra Diavolo,".....	Miss Minnie Bulgen
"Where Would I Be?".....	Alpine Quartet
Violin Solo—"Blue Bells of Scotland,".....	Frank Battilana
Contralto Solo—"Waiting,".....	Miss Weber
Selected.....	Electric Trio
Piano Solo—"Patrol Comique,".....	Miss Cushing
"Larboard Watch,".....	Alpine Quartet
Piano Solo—"Take Me, Jamie,".....	Miss Smith
Serenade.....	Orpheus Quartet
Baritone Solo—Selected.....	Mr. Trainor
Piano Solo—"La Troubillon,".....	Miss McCartney
Selection.....	Electric Trio
Humorous Recitation.....	C. J. Doyle
Comic Song.....	C. E. Rickey

Dancing was begun at about 10.30 o'clock and was continued through a programme of sixteen figures. The music for the dancers was furnished by Conterno's Band and Caterer Riley served an excellent supper for the members and their friends.

The officers of the club are as follows: W. H. Pearson, president; H. E. Dobson, vice-president; R. F. Doyle, financial secretary; Miss McElhaney, recording secretary; M. J. Phelan, treasurer. The Executive Committee are F. G. Payne, George Weideman, W. H. Brahe.

The committees having charge of the entertainment were:

Reception Committee—W. H. Pearson, chairman; H. E. Dobson, F. G. Payne, C. A. Kilfoyle, J. Slavenzek, George Weideman, M. J. Phelan, W. T. Rogers, J. J. Hughes, J. W. Holbrook.

Ladies' Committee—The Misses S. M. McElhaney, A. Cooper, H. Dooley, J. Henry, M. Connelly, K. Fitzpatrick, Stephenson, N. Patterson, B. Wilson, M. Leahey and Mrs. W. H. Pearson.

Floor Committee—R. F. Doyle, W. H. Brahe, J. J. Shaughnessy, J. Dempsey, J. J. Splame, A. E. Cassidy, E. J. Martin, C. G. Harvey, H. J. Lockner, C. J. Doyle and R. J. Ivers.

Among those present were: Mr. and Mrs. George Weideman, H. F. Beck, Miss Josie Polhemus, F. G. Payne, Mr. and Mrs. E. J.

Dingee, Jr., Mr. and Mrs. W. H. Pearson, R. F. Doyle, Miss M. Patterson, Mr. and Mrs. W. G. Peirson, J. W. Holbrook, Jr., Miss Holbrook, C. Rowland, Mr. and Mrs. W. P. Polhemus, Mr. and Mrs. L. C. Warner, W. T. Rogers, Mr. and Mrs. Battalina, George Henry, Miss Emma Neil, N. J. Payne and lady, Wm. Grogan, John Gill, Mr. Trainor and Miss Weber, C. A. Kilfoyle and Miss Smith, W. H. Brahe, Mr. and Mrs. L. Blend, W. A. Pohlman, Miss E. Wreidman, Miss Lydia Welch, Mr. and Mrs. M. Keogh, Miss Clara Blend, Mr. and Mrs. Armour, H. J. Lockner, Miss Lockner, M. J. Phelan, Miss McCartney, Mr. and Mrs. H. E. Dobson, E. G. Martin, E. E. Pierson, Miss S. McElhaney, Miss M. E. Connolly, Mr. Bulger and Miss W. Bulger, C. Annety and Miss Wilson, J. J. Shaughnessy and Miss M. Healy, J. Slavenzek, J. J. Hughes and Miss J. Powell, Mr. and Mrs. J. McCartney, B. J. Hobson and Miss Mamie Quinn, C. A. Harvey, Miss Harvey, C. J. Doyle, George Ellis, Miss Ray Weideman, Miss Julie Henry, John J. Madden, Adolph Weideman, Mr. Dooley and sister, Mr. Matthews, Miss Florence J. Deane and brother, Mr. and Mrs. John E. Hoey.

PHILADELPHIA W. U. NOTES.—Mr. David P. Emminger died on the 3d instant after eight weeks' illness, and was buried on the 7th. He had been superintendent of construction of this district for many years, and was esteemed by all who knew him. Miss Jessie Henderson returned to the office on the 10th after a two weeks' illness. Writers of sentimental notes are not aware how many eyes devour their contents after they have been read and left on the tables. All-night chief Leo Firman was married on the 5th instant, and upon his return to the office on the 10th, was congratulated and presented with a beautiful French clock and ornaments by the night force. Mr. Edward B. Rohn, of Allentown, visited us on the 9th, and was entertained during his stay in the city by Mr. Preston Stratton.

CHICAGO NOTES.—Harry Tarnell has returned from a two months' confinement with lung fever at his home in Indiana. Mr. John Savoy has become one of the day force, and is on 1st Milwaukee. Missouri Linseed Oil Co. for Missouri Linseed Oil Co.; Mc Chell—Mitchell—are errors lately recorded in the Western Union office. Mr. McKee is a late arrival from Omaha, having exchanged places with Mr. Kenney, late of Portland, Oregon. "Hank" Smith, of the *Daily News* detail, is a new addition on the night force.

ST. LOUIS POSTAL NOTES.—Thomas P. Wheeler has just returned from a month's vacation on his farm at Walnut, Kan., looking brown as a berry and in excellent health. During his absence Mr. C. F. Bartlett acted as night manager, and L. K. Hutchinson assistant day chief. Walter Anderson has taken charge of the Venice, Ill. office at the eastern approach of the new "merchants" bridge. Miss Katie Mullen succeeds Mr. Anderson in the main office. Business shows a steady and healthy increase. More wires are needed both between here and Chicago, and to Kansas City. Mr. Gerald G. Smythe, late Norton & Worthington, private line operator, has accepted a position on the night force, Western Union, this city. James McAndrews, late of Chicago, is on the extra list. Miss Mollie Landrigan, (first Chicago) is one of the most expert lady operators in the country. It is asserted that she will soon retire and enter the matrimonial state. John Dale succeeds E. L. Dougherty at "Mx." who resigned to enter college. "Nick" Burke, an old operator, is now editor of the *Globe-Democrat*. He succeeded Wm. M. Spink, who filled the position a number of years up to the time of his death. Sedalia, Mo. office has been moved to 213 Ohio street, into elegant quarters. It is under the able management of Mr. W. F. Logan. The receipts have increased materially, and the office is assuming importance.

THE MILITARY TELEGRAPHERS.—The adjourned annual meeting of the Kansas City branch of the United States Military Telegraph corps was held at that place a few days ago. Day K. Smith was elected president; J. D. Cruise, vice-president; and D. A. Williams, secretary and treasurer. This is the old staff of officers except the vice-president. J. D. Cruise succeeds W. H. Wooding. O. H. Dorrance, J. B. Clark, L. F. Sheldon and a Mr. Burton were elected members. The members of the Old Timers Association have joined the Kansas City Electrical Society, and they now act with that organization. Any telegrapher who has been in the service twenty years is eligible to membership in the Old Timers organization. This organization and the United States Military Telegraph corps have worked together, as all the members of the military corps are eligible as Old Timers, but no one can belong to the Military corps unless he served as an operator in the war. The national meetings of both these organizations will be held in this city during the week of September 8. At the meeting the entertainment and reception of the delegates to that convention was discussed. During the meeting letters were read from Senator Cockrell and Congressman Tarsney in reference to the bill introduced in Congress for proper recognition of the telegraphers who were in the federal service during the war.

RECEPTION BY MRS. EDISON.—Mrs. Thomas A. Edison gave a reception at her elegant residence "Glenmont", Llewellyn Park, Orange, N. J., on the 5th instant. It was one of the most elegant affairs ever witnessed in the vicinity. The interior of the handsome house was gorgeously decorated with potted plants and cut flowers. The reception hall was the chief point of decoration. A massive bank of palms, ferns and bouquets of roses were arranged outside the staircase. The chandeliers were almost hidden with smilax, and the effect that the incandescent light made, throwing rays of light through the beautiful green, was grand. Mrs. Edison received in the main drawing-room, and was assisted by Mrs. Simon Edison, a sister-in-law of Mr. Edison, Miss Studebaker and Mrs. Francis R. Upton. In the conservatory, which contains the most valuable collection of orchids in this country, the New York Philharmonic Club of five pieces were stationed, and played many choice selections. The conservatory was lighted with a myriad of incandescent lights, with shades of all colors. The dining room was also gorgeously illuminated with incandescent lights. A large number of leading society people were present, about 150 in all, and the affair passed off in a most delightful manner.

FOUND HIS MAN.—The average district messenger boy is so little infected with the feverish haste which is so characteristic of American business life that the performance of a messenger boy at Lincoln, Neb., stands out somewhat conspicuously. Having been sent to the depot with a message for a gentleman about to leave on a train, he arrived just as the train was pulling out. He did not propose, however, to lose his man, so jumping on the rear car, he pulled the bell rope, stopped the train, found his man, and got off the train while the brakeman was looking for the cause of the alarm.

T. M. B. A.—Assessment 238 has been levied to meet the claims arising from the deaths of S. P. Hill, which occurred at Allegheny City, Pa., November 21; M. C. Dodd, at Newark, N. J., December 1; W. W. Fuller, at Columbus, Ind., December 9, and F. L. Vreedenburg, at St. Johns, Mich., December 16, and should be paid before March 1.

OUR CATALOGUE.—Send for our latest catalogue of books. We keep all electrical books on hand.

The Ohio Legislature will be asked to reduce telephone rates.

NEW APPLICATIONS OF THE C. & C. MOTOR.

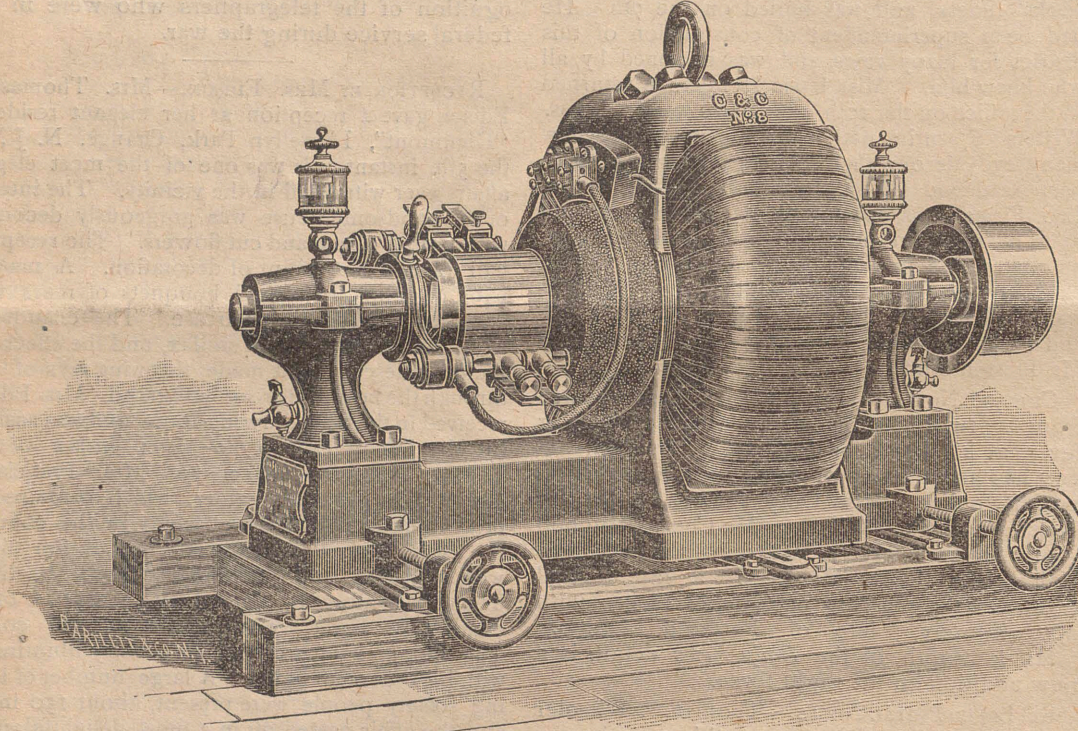
New uses and applications are daily being found for the electric motor. It is five years since the first electric motor was introduced into New York City, and now there are between 25,000 and 30,000 in daily use on the various electric light circuits throughout the country. Their applications are divided into three principal heads: that of traction service, mining, and for distributing power in small units in populous districts. There is also a fourth, which, although as yet developed to a very small extent will, we think, before long become one of the chief and most profitable uses for electric power. We mean electric motors as applied to factory buildings and generally as a substitute for belting and shafting.

Last year at this time the C. & C. Electric Motor Company opened their new building in Greenwich street for the manufacture of their motors, and at first found it necessary to occupy only two floors of their six story building. As the building was fire proof throughout, the floors being of brick and stone, they placed a dynamo in the basement, and ran their ma-

and the plant at the Chicago Printing Company's office in Chicago; the *Star* newspaper in Washington, and the Auditorium Building, Chicago, are among the largest electric power plants that were installed last year, and the plant of the Hickok Mfg. Company and Huyler's are the first of a new class of power plants which will bring about great changes in our present methods of furnishing power for factories.

This company made its name in the field of little motors and fan outfits long before it became known as the maker of large machines. In the Summers of 1888-89 over a thousand of these fan outfits were distributed among the offices and restaurants of New York City, more than a hundred being placed in the Equitable building alone. The new White Star steamship "Teutonic," as well as the "Celtic," the United States cruisers "Chicago" and "Charleston" are making use of a number of them for ventilating their interior state rooms and hallways. They were placed in the vestibule trains running between New York and Boston, and the air in the Mikado's palace in Japan is kept in circulation by several of these C. & C. fan outfits.

A two horse-power motor in the new form has been made up in combination with the



NEW TYPE C. & C. MOTOR.

chinery in the two upper floors by means of motors, running their wires to the motors in conduits which were already provided in the walls of the building, and thus avoided the necessity of defacing their floors by cutting holes in them for belting and shafting. With their greatly increased facilities they began at once the construction of large motors and dynamos, and at the present time are occupying the entire six floors of their factory.

The new machine which they put on the market last year is now built in the various larger sizes from one horse-power to fifty horse-power. Its most striking characteristics are a saving of superfluous metal, the large diameter of the armature, allowing ample wire space, long bearings, large shafts and generally the combination of great strength and durability with symmetry of form. About one hundred of these motors of one horse-power and over have been placed on circuits of different incandescent light companies, and they have been received with an approbation which has proved very gratifying to the manufacturers.

The installation of 75 horse-power motors in the new factory of the Hickok Mfg. Company of Harrisburg, Pa., and 70 horse-power in Huyler's factory on 18th street, New York City,

Sturtevant blower to ventilate the dynamo room of the cruiser "Baltimore," and two more have been recently finished for the new cruiser "San Francisco." The small space occupied by the motor in this combination, and the neatness and beauty of the design, cannot fail to strike observers.

The application of these motors to pumps, hoists, drills and tram cars is revolutionizing the old systems of mining, and although this field for electric power is perhaps less developed than any other, it is likely during the coming year to make a very noticeable advance.

PHONOGRAPHIC TYPEWRITING.—There is a "new departure" in typewriting in connection with the use of the phonograph that many firms are beginning to avail themselves of. A banker has a quiet talk with his phonograph in his private office, and sends the cylinder around to a "phonographic typewriting" office. Here the talk is reproduced, and the typewritten work sent back to the business man. This method is considered by those who use it to be far preferable to stenographic dictation.

NEW TELEPHONE LINE IN SCOTLAND.—A new telephone line is being erected between Glasgow and Edinburgh.

MORE SPRAGUE ELECTRIC RAILWAYS.

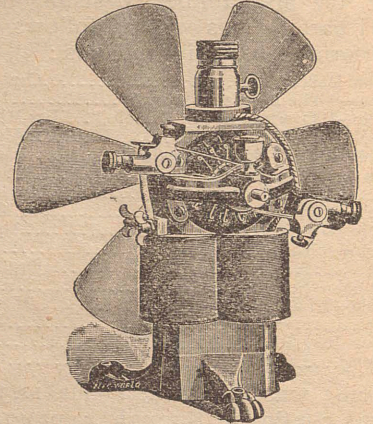
The mid-winter is not generally considered by street railway construction companies to be the most active and busy time of the year. The conditions of soil and weather are unfavorable for outside work, and the amount of business to be performed by the street railway companies is not so great as in the summer months, and does not encourage extensions. But with the prominent electric railway supply companies the season seems to have no effect upon the amount of business contracted for and under construction, unless it is to increase it. We are advised by the Sprague Electric Railway & Motor Company that winter makes no difference with its business, and that during the last few months an unusually large number of contracts have been closed for electrical apparatus, and that construction work will go on right through the winter.

A list of the roads which have ordered equipments from this company illustrates in a striking way the remarkable confidence which street railway managers feel in the electric system, and is indicative of a widespread adoption throughout the country by street railway companies of electrical apparatus. Among the most recent contracts of the Sprague Company may be mentioned the following:

Salem, Ohio, Capital City Street R'way,	2 cars.
Davenport, Ia., Davenport Electric St. R'way Co.	4 "
Dubuque, Ia., Electric Light & Power Co.,	10 "
Chicago, Ill., Cicero & Proviso St. R'way,	12 "

and the following additional orders from street railway companies already equipped by Sprague or other systems.

Sioux City, Ia., Sioux City Electric R'way,	3 cars.
Milwaukee, Wis., West Side Street R'way,	9 "
Des Moines, Ia., Des Moines Electric R'way,	2 "



C. & C. FAN AND MOTOR OUTFIT.

MEASURING POTENTIALS.—A patent has recently been granted in England to Sir Wm. Thomson for "Electro-static apparatus for measuring potentials." The inventor uses an electro-static arrangement of which the part whose potential differs most from the earth is a smooth insulated conductor, which may be of a cellular or multicellular form. The movable body may be a metal plate, or an arm, or a group of metal plates or vanes. The electro-static force acting upon the movable body may be equilibrated by torsion, or by torsion and gravity, as in the well known bifilar balance; or by gravity as in an ordinary balance; and may be read by inspection on a scale, or may be determined by a balancing operation. For checking the vibration of the index, the inventor uses a rigid or elastic piece of solid material which may be brought momentarily and gently to touch upon the index itself or other connected moving part of the apparatus. To prevent all other motion of the checker than the one desired motion he mounts it on a geometrical slide.

The South Brunswick Telegraph, Telephone Electric Light & Power Company has been incorporated at Brunswick, Ga., with a capital of \$50,000.

THE LUMINOUS INTENSITY OF ARC LAMPS.

Some interesting trials relative to the luminous power of arc lamps have just been carried out at the Berlin High School in accordance with certain exigencies of the civil authorities. The latter had stipulated in their forms of contract that arc lamps should give, with a current of 12 ampères, 2,000 candles, and, in some cases, 5,000 candles. Herr Elston called all the parties interested together and raised a lively discussion by affirming that the lamps at present in use did not give more than 500 candles. After this meeting the Berlin Allgemeine Elektrizitäts Gesellschaft instituted a series of experiments at the electro-technical laboratory of the High School under the direction of Prof. Slaby. Dr. Wedding, in giving an account of these trials, started a sharp debate *apropos* of what was to be understood by the expression "A 2,000-candle arc lamp." Was this with or without globe? Was it under a given angle, or was it the total intensity?

The measure of luminous intensity must not be taken from any particular angle, since it varies according to the angle. If the lamp be intended to light open spaces, it is necessary to determine the different values of this intensity from the horizontal direction to the vertical direction downwards; if, on the contrary, the lamp is to light a covered space, it is as well to take into account also the luminous rays comprised between the horizontal position and the vertical position upwards. Measurements in these different azimuths were made by the aid of mirrors. The experiments were made on differential lamps of the Siemens type in Unter den Linden. The intensity of the current was from 14 to 15 ampères, and the difference of potential from 48 to 52 volts. The place where these measurements were made being very high, the luminous intensity could be measured at different angles without having recourse to mirrors; the photometer used was one of Elster's, which is a modification of Bunsen's. The carbons seldom burnt badly, but the two sides were not so brilliant, so that two photometers had to be used, one on each side, to collate the results and take the means. The unit adopted was that of the German candle, which corresponds nearly with the decimal candle. The intermediary light chosen was that of an Albert gasburner.

The intensity following the horizontal direction was weak (without globe, total intensity=196 candles); then it increased rapidly, and attained about 1,150 candles at 20° and a maximum of 2,014 candles at 42°; then it rapidly decreased, and at 60° the light was sensibly null. From this it results that the average luminous intensity of the surface lighted was 1,228 candles, without globe. With globes, the division of the light was quite different.

Three globes were used in the experiments which showed the average horizontal intensity to be 478; average maximum intensity 925, and the average mean 692.

From these figures it appears that the mean intensity is only from 40 to 53 per cent. of the intensity of the lamp without a globe. By adding a reflector, the loss due to the globe may be reduced to 32 per cent. By tracing, in the streets to be lighted, the lighting curves at different points, corresponding to a height a little less than that of the head of a man, and the lamps being placed at 8.90 metres from the ground, the light necessary to read (or 10 candles at 1 metre) is obtained for a distance from the lamp of 25 metres; the lamps should therefore be 50 metres apart. Dr. Wedding finds, also, that the actual luminous power of Siemens differential lamps with globes like those used in Berlin, varies from 510 candles following the vertical direction downwards to 1,183 at an angle of 40° with the horizontal and 640 at an inclination of 5°. In short, with the most transparent globes, which have been supplied and with reflectors freshly painted, the mean luminous intensity was 834 candles. Herr Elster, in his experiments on the lighting of the present streets, obtained a

maximum of 640 candles; more recent experiments only gave 500 candles.

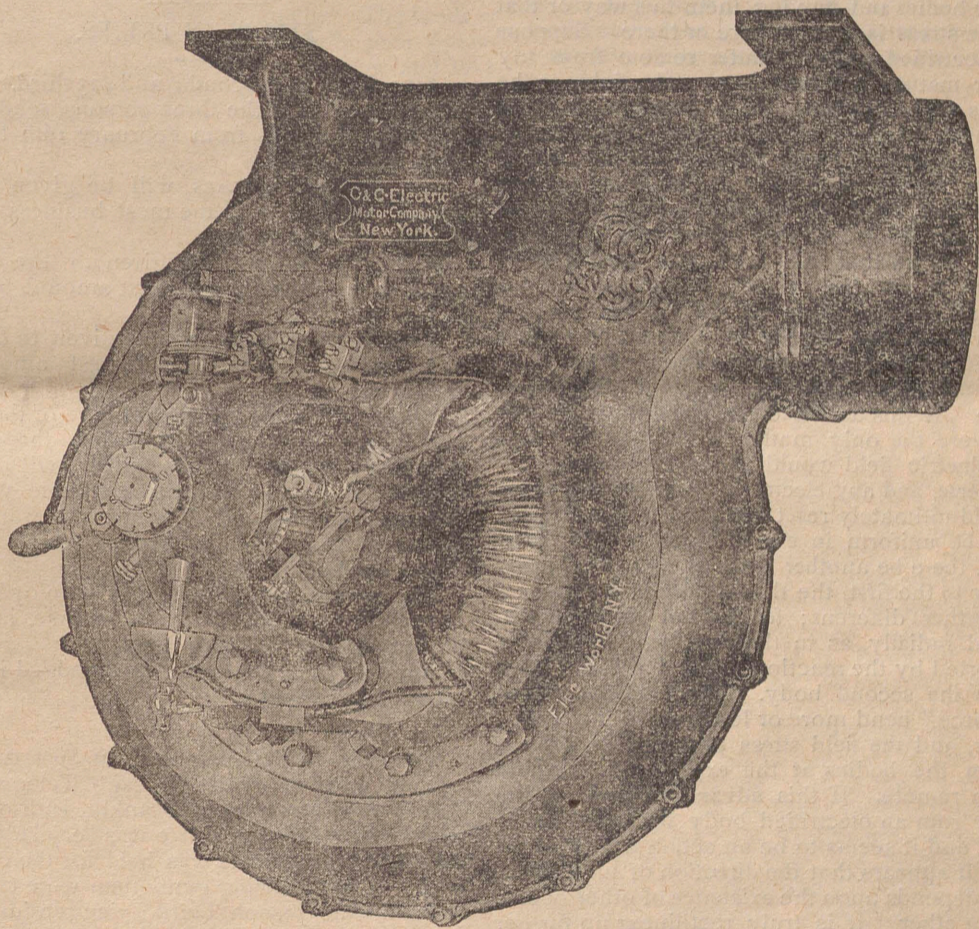
These experiments, carefully executed as they were, throw great light on the practical conditions of public lighting, and justify the disappointments which have often been experienced with arc lighting, despite the high nominal luminous intensity of 2,000 to 3,000 candles of lamps which had been announced by the makers.—*Le Moniteur Industriel*.

THE FRENCH GOVERNMENT AND THE EASTERN TELEGRAPH COMPANY.—An official decree of the French Government has been published, approving the renewal of two telegraph conventions with the Eastern Telegraph Company. The Government have compelled the company to make some concessions in the public interest. The company have to pay a largely increased price for their special line from London to Marseilles, and they are bound to land at Marseilles a third cable, running by way of Malta and Bona, in Africa. The company will also have to reduce their rates for telegrams in plain language to the French Press in

ELECTRIC RAILWAYS.—F. J. Sprague gives it as his opinion that the electric railway has nothing to fear from the cable system. In fact, he remarked that since the cable conduits were usually well constructed by competent engineers, they would prove a first-class receptacle for the electric conductors which will be certain to follow, and hence, whenever he heard of the laying of a new cable conduit he was well pleased.

DANGEROUS LAMPS.—Complaint is made by the Boston papers of the careless manner in which some of the lamps on commercial circuits are hung. It is claimed they are lower than is consistent with safety, and the companies are urged to investigate the matter before some one comes into accidental contact with them and gets hurt, if not killed.

In Berlin electric lights of standard power, with great and steady brilliancy, light the city at a cost of less than fifteen cents per night, about \$55 per year.



C. & C. MOTOR AND STURTEVANT BLOWER.

the extreme East, and the rates must, furthermore, never exceed those for the English Press telegrams to Cochin China, Annam and Tonking, viz.: three francs a word.

ZINC.—The destruction by rust of two of our great ironclad ships which were recently found with their hulls corroded entirely through, calls to mind an ingenious application of voltaic electricity, by which the English ironclads are now successfully protected. Taking advantage of the fact that when a battery is formed of iron or zinc in a corroding solution, the zinc is most readily acted upon, many of the later ships have their iron hulls cased with boards, over which are nailed sheets of zinc. At intervals, through holes in the boards, connection is made between the two metals. On exposure to the action of sea-water, it is found that the zinc is dissolved away, and must be periodically replaced, but so long as any zinc remains, the iron under it is perfectly protected against rust, by the transfer of the chemical action to the zinc.

Do NOT INVEST IN THIS SCHEME.—England has its cranks as well as we. The following story comes from London, and as a "wild cat" scheme, it equals anything ever gotten up anywhere to fool the unsuspecting public:

A peculiar formation exists in one of the lead mines in Derbyshire. Not only is there a marked stratification of almost pure lead in the form of thick plates, but by a natural chemical action not easily explainable, the plates are coated evenly with peroxide of lead. Several enterprising capitalists have, it is said, taken advantage of this remarkable arrangement, and have succeeded in making a case of insulating and acid proof material around and under the whole. The next step will be to erect a large number of lightning conductors in the vicinity of the mine to charge the vast "accumulator," and the supply to be obtained from one electrical storm of ordinary severity will, it is expected, be sufficient to light the entire country, yielding at least 10,000 ampère hours.

The Flushing Electric Light & Power Company has been incorporated at Flushing, N. Y.; capital \$30,000.

ELECTRIC AND MAGNETIC FIELDS.

When the physical state of a body reacts upon the medium that surrounds it so as to produce in the medium a state of stress or motion, or both, the space within which such effects are produced is called the "field" of the body. When a body is made to assume two or more physical states simultaneously, each state produces its own field independent of the existence of the others: hence two or more fields may co-exist in the same space. For instance, if a magnet be electrified, both the magnetic and the electric fields occupy the same space, and each as if the other did not exist.

Suppose a glass rod be electrified with silk or cat skin. It is experimentally known that other bodies in its neighborhood are physically affected by its mere presence without contact, and various motions result which are commonly attributed to electric attraction or repulsion. The phenomena are explained as due to the stress into which the neighboring ether is thrown by the electrified body, the stress reacting upon other bodies and moving them this way or that as the stress is greater here or there. Suppose an electrified mass of matter remote from any other matter, in free space. The field, or the stress that constitutes it, is found to vary in strength inversely as the square of the distance from the body in every direction about it, which shows that the effect upon the ether is uniform in all directions, and that for such a stress under such conditions the ether is isotropic. Experiment shows that this kind of a stress travels outwards with the velocity of 186,000 miles a second, or the same as that of light, which shows that the velocity of motion in the ether depends solely upon the properties of the ether, and not at all upon the source of the disturbance. If this assumed electrified mass of matter were the only matter in the universe, then its electric field would be as extensive as the universe, and any electric change in the mass would ultimately react upon the whole of space and be uniform in every direction. If, however, there be another mass of matter in proximity to the first, the disposition of the stress is altogether different; for instead of being disposed radially, as in the first case, the field is distorted by the reaction of the distressed ether upon the second body. The so-called "lines of force" bend more or less toward the second body, and the field stress becomes denser between the bodies at the expense of the field more remote. If this advancing stress in the ether from an electrified body be called radiation, and it seems to be an action of that kind, then it appears that the direction of such radiation depends upon the existence of other bodies in the ether. It is truly rectilinear no further than the shortest distance between the two bodies.

The electric field thus produced and thus reacting upon another body develops in the latter an electrical condition—that is to say, it electrifies it; and the process we call "electric induction," to distinguish it from the transference of the electrification by contact, which is called "conduction." In the process called induction there are two transformations; in conduction there is simply a transference, and no transformation. The experimental fact is this: an electrified body sets up in the ether a stress of such a nature that, by its re-action upon another body, the latter is brought into a condition similar to that of the first—that is, it electrifies it.

A magnet in like manner sets up in the ether a stress that is propagated outward with the velocity of light. The physical character of this stress is such that iron and some other substances upon which it can re-act are thereby rendered magnetic. Their molecules are rearranged. On the supposition that a piece of iron were suddenly magnetized in any way remote from any magnetizable substance, the magnetic field would spread radially, having a

spherical surface. As soon, however, as a piece of magnetizable substance was reached, the re-action of the ether upon it would begin; and the so-called magnetic lines of force will now be curves, and the equipotential surfaces will no longer be spherical. The distortion will depend upon the size, shape and quality of the second body, as well as upon the strength of the field.

This process is called "magnetic induction." The magnetic field differs from the electric field in this important particular: the latter has no selective property, but re-acts upon all substances, while the magnetic field re-acts upon iron and a few other substances, and but slightly, if at all, upon most bodies. They are alike, however, in this: their equipotential surfaces are determined by the presence or absence of other bodies.

A magnet then sets up such a physical condition in the ether that its re-action upon another body brings the latter into a condition similar to that of the first—that is, it magnetizes it.—PROF. A. E. DOLBEAR in *Science*.

\$175.00 IN PRIZES.

\$100 first; \$50 second; and \$25 third. Prizes to be awarded to the three persons sending us the most business from February 16th to Nov. 16th, 1890.

ONE HUNDRED DOLLARS will be given to the person who sends us the most business during the ten months named.

FIFTY DOLLARS will be given to the person sending us the second largest amount of business.

TWENTY-FIVE DOLLARS will be given to the person sending us the third largest amount of business.

These prizes are given exclusive of the usual commissions allowed; therefore those who work hard for one of these prizes will also be liberally compensated for the trouble with increased commissions. The first prize amounts to \$10 per month—a handsome sum of money for so small an effort.

Any person, except a regular employé of the paper, is qualified. This, of course, includes all agents and correspondents.

All remittances will be acknowledged in each issue of the paper.

THE CHICAGO TELEGRAPHERS' AID SOCIETY.—The annual meeting of the Chicago Telegraphers' Aid Society was held in Franklin Hall on February 9th. The attendance was very large, and an election of officers was held for the coming year. The following gentlemen were elected:

President, Joseph Laird; vice-president, H. Jahn; secretary, William Wallace; treasurer, W. E. Griffiths.

Executive Committee—Messrs. Laird, Jahn, Wallace, Griffiths, Persells, Savoy, Clevenberg, Potter, Roswell, Henderson and Perrin.

Auditing Committee—Messrs. H. G. McGill, Joseph Larue and D. J. McLoraine.

Trustees—W. E. Griffiths, J. F. Butterfield and W. J. Dalton.

TO EXTEND THE POSTAL'S LINES.—It is said that one of the objects of Mr. J. W. Mackay's present visit to the United States is the extension of his telegraph lines. The Mackay telegraph investments are now estimated at \$11,000,000, principally represented by the postal telegraph lines and the Mackay cables. They also claim that he has been offered \$19,000,000 cash for these interests, which, they add, are not for sale. It is said that he proposes to expend about \$3,500,000 more in building up his telegraph system, and that he will make these expenditures out of the income derived from both companies—the telegraph lines and cables—and that when this shall have been done, the earning power of the latter will equal that of the Western Union.

A LAZY MESSENGER.—A telegraph messenger boy has caused an untold amount of trouble in Boston society. Many of the aristocratic families of the Back Bay district have wondered why they were not invited to Mrs. Commodore Weld's reception. For a fortnight they have felt miffed and slighted, and on every occasion they have cut the Welds with an indifference chillier than Boston's east wind. At the same time Mrs. Commodore Weld has been wondering what it all meant, why her reception was slighted by so many desirable people. But light has finally been shed upon this painful mystery. The messenger boy was at the bottom of it. A package of the elegantly engrossed invitations, directed to the swell people of the Back Bay have been found floating in the Charles river, where the indolent youngster had thrown them.

THE POSTAL COMPANY IN THE WEST.—The Postal Telegraph Company has completed its line to Emporia, Kan., and has opened up an office there. The company is pushing its lines forward, with Galveston and Salt Lake City as termini of the two principal lines. At Salt Lake City the line will connect with the existing lines, the company already having a system in operation on the Pacific Coast, and operated around by St. Paul to New York.

A WISE BILL.—A bill is before the Ohio legislature prohibiting the employment of train despatchers or telegraph operators for duties other than those connected with the instruments. This step is in the right direction, as thousands of lives are jeopardized every day on railroads through the common and dangerous practice of requiring despatchers and operators to perform all sorts of duties.

CONVENTION RATIFIED.—The Chefoo telegraph convention has at last been ratified by the Tsung Li Yamen. It is an agreement between the Chinese Telegraph Administration and the Eastern Extension and Northern Telegraph Companies, to act in concert in the matter of telegraph rates to the far East. A uniform rate of \$2 per word from all parts of China to Europe will be charged.

NEW LINE TO NEW YORK.—The Commercial Union Telegraph Company, of Cohoes, N. Y., has filed a certificate of increase of capital stock, \$300,000 to \$500,000, in the Secretary of State's office. It is the intention of the company to connect Albany with Kingston, Rondout, Newburg and New York, with branch lines to Poughkeepsie and Pawling.

THE BODY A BATTERY.—The French Academy of Science has discovered, by experiment, that each human body is in itself an electric battery, one electrode being represented by the head and the other by the feet. Therefore it is the proper thing to sleep with one's head to the north and feet to the south.

NEW TELEGRAPH LINE.—A company is being organized of Sioux City and Sioux Falls capitalists to build a telegraph line between the two cities, and have it operated by the Postal Telegraph Company.

A QUICK ANSWER.—A message recently sent by telegraph from Portland, Ohio, to Hong Kong, by way of New York and London, cost \$2.37 a word. An answer was received in twelve hours.

"I would like to have a holiday to-morrow, if you please, sir," said a telephone girl to the manager.

"You can have one; but I should think you had holler days enough already," replied the manager wearily.

EVOLUTION OF THE "PLUG."

A *World-Herald* reporter and an old time telegraph operator spent an hour together recently. The operator was talkative and unboomed himself concerning his craft. The substance of his plaintive tale is given:

"Where do they all come from?" is a question often asked relative to the numerous telegraph operators who daily keep the thousands of miles of wire busy throughout the world. And the question truthfully answered would be that they come from the farm and the school. To see the flashily dressed young man who presides over the country telegraph office and vends tickets and postage stamps to the village constituency, it would be hard to believe that two years previous he had sworn at a mule team while hauling rails to build a corn rick. Yet such is generally the fact. Many members of the profession may take umbrage at the statement, and it may be an injustice to some of them, especially to those employed by the commercial companies. These generally acquire their art while clerking in telegraph offices or acting as messenger boys. But it is to the railroad operator that it most refers.

The small country offices are generally supplied with a huge cannon stove, which is at all times kept red-hot, regardless of the expense to the company. During the winter this station forms an excellent place for the farmer boys to loaf and keep the switch lights clean for the presiding genius of the station. As they gaze upon their own rough habiliments and then upon the raiment of the lightning jerker they utterly forget the tenth commandment and covet his position. When they learn that the man with store clothes receives \$10 per week for sitting around, reading novels, while they in summer must follow the plow and binder for \$16 per month and "found," and in winter must feed the stock and chop cord-wood for their feed only, down in the depths of their heart a yearning to master the art of sign communication grows strong. Finally a compact is made with the operator by which the tiller of the soil agrees to transfer \$5 per month to the purse of the telegrapher and to carry coal, sweep out the office and clean the lamps, in return for which the dot and dash man will teach the mysteries of the art to the lad. The contract made, bright and early the "plug" shows up. The floor of the office is swept clean, the lamp chimneys polished and the coal box filled to overflowing. A "local set" is put up and after the alphabet is duly memorized the task of murdering Morse is duly begun. The lad is now the envied one for miles around. For is he not learning to be an operator? The days, weeks and months roll by and spring sowing is at hand, but still the lad lingers at the musty little station with a piece of clip and a pencil copying the messages as they incessantly click by. Soon he is considered competent to take a train order, and now his proudest moment has arrived. After much labor he composes an application for a position, and being duly recommended by his tutor he is notified to hold himself in readiness for extra duty. Proudly does he exhibit this, his first official order, among his associates, who are now busy planting corn and harrowing the meadows. By and by the night man up the road goes to sleep and stops the fast mail. He is reported and receives a request to take a ten days' vacation. The new operator is called into requisition and thus another operator has been launched upon the railroad world to compete with the thousands already in the business.

Finally he drifts back to his old home and secures the place formerly held by his tutor. Very often he takes it at a lower rate of salary, and the following winter, instead of the student being taught, he undertakes to initiate all the farmer lads in that district into the mysteries of the dot and dash language. Soon he has manufactured enough "ham operators" to man a small railroad, while the man who taught him is back at home measuring calico, and selling sugar, wondering why it is so difficult to secure a position at his

trade. Now, take all the country stations along the lines of the different railroads and average them with the one just described and the great number of unemployed telegraphers who travel about the country on freight trains, sleeping in telegraph offices and trusting to the liberality of their more fortunate brothers, who have a situation, for their meals, are easily accounted for. At present the railroad men have formed an organization to curtail the production of "hams" and "plugs", yet it will take a very close organization to do away with the farm hand telegrapher.

The telegraph schools about the country are another source from which poor operators spring. These schools, which are run for revenue only, advertise largely in the country papers for boys and girls to learn telegraphy and take positions at once, paying \$60, \$70, \$80, \$90 and \$125 per month. This advertisement is a delusion and a snare and intended to catch people with more money than brains. The boys and girls throughout the land read the attractive advertisement, and being assured that they can learn the business in three or four months, pay the "principal" of the school \$50, always in advance, and in return for it gain a meagre knowledge of telegraphy. The heads of these telegraph schools are generally poor operators, who are unable to hold a position and take this method of making money. A teacher in a school at Kansas City at one time showed me a letter from one of his applicants in which the word telegraphy was spelled "tilligraphy" and said: "This is generally the class of students I have. So you see my school does not injure the profession much, as such people as that generally give the business up in disgust after a few weeks' study. I am in this business because I can make \$300 per month out of it, when my abilities would not bring me in \$50 per month on the railroad." The large salaries they advertise are the very largest paid and are earned only by the strictly expert operators, wire men and train dispatchers. The ordinary railroad operator receives \$45 per month, which is but little more than the laborer on the section receives. But the telegraph schools turn out but few operators. Their students generally give up in disgust or manage to work themselves into an office, to perfect what little knowledge they have accumulated.—*Omaha World Herald*.

CHICAGO WESTERN UNION NOTES.—The customary February dullness is upon us. The month was ushered in with a number of very severe snow and "nor-wester" storms in the warm weather belt. Its effects have been felt here in Chicago to an enormous extent, but with the real Western pluck and energy, the size of the stack of detained messages has been greatly reduced. There only remained some 800 messages of back dates in "C. H." on the 5th inst., but they were gone on the 6th, and now we are rolling the ball as usual. Every wire was down west of Helena, west of Ogden, and north of San Francisco, and Portland, Tacoma, Seattle, Spokane Falls, etc., were shut off from the outside for some six days. The new copper wire between St. Paul and Helena and one of our quads to St. Paul, connected with the former, is proving a success. It was a much longed-for necessity. Mr. A. A. Vanderhoof has resigned and left us. Our esteemed time-keeper, Mr. Tom Gillette, has devised a time book, and finds a ready sale for it. It is gotten up very nicely. Frank Thomson, of St. Paul, called on us for a few days, but left for St. Louis. Mr. R. J. Gray, manager of the advertising department of the *Age*, was a pleasant and welcome visitor to "our sanctum" a few days ago. The dynamo has been successfully launched into connection with the operating department, and was well received on all sides. The replacing of old sounders with bran new ones was necessitated on most of the tables.

WATER POWER FOR ELECTRIC LIGHTS.—The electric light plant at Davenport, Iowa, is run by water power at Moline, several miles distant.

DIED

On Friday, February 7th, at 4 A. M. at the residence of her parents, 98 Dikeman St., South Brooklyn, N. Y., Nellie Madden, formerly an operator at 195 Broadway. Some two years since a severe cold culminated in bronchial pneumonia, and for weeks death seemed imminent, but she rallied and her brave spirit met calmly the sufferings consequent on a gradual decline. To her friends, during the last weeks of her life, with angelic smiles and ever luminous with Faith's fruition, she spoke freely of the coming change. The tender tokens of remembrance from her former business associates touched her deeply, and (to use her own words) "gave courage to meet even death!" They helped build the ladder of hope, on which her spirit climbed to heaven.

She had the gentle, reticent bearing, which is woman's chief adornment, and her shield.

Her funeral, which took place from her parents' home on Sunday, February 9th, was largely attended by the operators from 195 Broadway, who sent a beautiful wreath of camellias as a slight token of the high regard in which they held her. May God comfort the hearts of her sorrow-stricken parents, also of her brother and sister, both of whom are well-known Brooklyn operators.

"There is a Reaper whose name is Death,
And with his sickle keen
He reaps the bearded grain at a breath,
And the flowers that grow between."

This flower was too sweet for earth, and God in his wisdom has transplanted it in his own heavenly garden.

PITTSBURGH NOTES.—H. R. Swivell has resigned his position here with the Associated Press and is succeeded by Mr. Betz of Columbus, Ohio. The item sent out by the Associated Press from Chicago sometime ago, that Chicago was the first office in the country to use the dynamo for all purposes, was a great mistake, as Pittsburgh has not had a cell of battery about the building for almost two years, utilizing the dynamo for all purposes even to the clock system. W. J. Byrnes has returned to work after a severe attack of pneumonia. Philo. S. Dilworth has abandoned the chicken farm and will hereafter devote his sparetime to the honey industry. Orders by mail will receive prompt attention. R. D. E. Rowe, of Titusville, Pa., has been appointed Manager of Allegheny City Western Union office, vice, O. P. Woods, transferred to "G." H. S. Dearing has resigned on account of ill health and gone to Morgantown, W. Va., to recuperate. Among the old timers, the Catlin contest has awakened lively interest, and the following well-known telegraphers declare themselves ready for the fray: Loy McMullen, P. J. McKeever, Dode Moreland, George O. Morse and "the only" Eitemiller. Charles A. Mitinger is a candidate for the city council and is assured the support of all the boys. E. C. Bishop also has political aspirations. Samuel Marks, of the book-keepers department has resigned to engage in the clothing business. Mr. James E. Roeve, of Oil City, has been appointed Superintendent of Telegraph Department for the W. & A. Pipe Lines, with headquarters at Pittsburgh, Pa. Mr. John R. Mess has been appointed night operator for P. C. & St. L. R. R. at Pittsburgh. The W. & A. Pipe Line will build another telegraph line from Pittsburgh to Butler Pa. A. B. Campbell has been transferred from Valencia to Glade Run, and W. H. Rughner, from Thorncreek to Little Creek.

AN EXPLANATION.—In our issue of the 8th instant, a description was given of the wiring of the Rouss Building on Broadway. In that connection we inadvertently failed to state that the Tucker Electrical Construction Company of this city was the contracting company. This well-known concern installed the complete plant and wired the building throughout, and the entire work has been done in a manner which reflects great credit on the company.

EDISON'S START IN LIFE.

HOW THE GREAT ELECTRICIAN MADE HIS FIRST HIT
IN BUSINESS AND REALIZED THE IMPORT-
ANCE OF THE TELEGRAPH.

The following is one of the "Talks with Edison," which George Parsons Lathrop reports in *Harper's Magazine* for February: "At the beginning of the Civil War," said Mr. Edison, "I was slaving late and early at selling papers; but, to tell the truth, I was not making a fortune. I worked on so small a margin that I had to be mighty careful not to overload myself with papers that I couldn't sell. On the other hand, I could not afford to carry so few that I should find myself sold out long before the end of my trip. To enable myself to hit the happy mean, I formed a plan which turned out admirably. I made a friend of one of the compositors in the *Free Press* office, and persuaded him to show me every day a 'galley proof' of the most important news article. From a study of its headlines I soon learned to gauge the value of the day's news and its selling capacity, so that I could form a tolerably correct estimate of the number of papers I should need. As a rule, I could dispose of about 200; but if there was any special news from the seat of war, the sale ran up to 300 or over. Well, one day my compositor brought me a proof slip of which nearly the whole was taken up with a gigantic display head. It was the first report of the battle of Pittsburg Landing—afterward called Shiloh, you know—and it gave the number of killed and wounded as 60,000 men!

"I grasped the situation at once. Here was a chance for enormous sales, if only the people along the line could know what had happened; if only they could see the proof slip I was then reading! Suddenly an idea occurred to me. I rushed off to the telegraph operator and gravely made a proposition to him, which he received just as gravely. He, on his part, was to wire to each of the principal stations on our route, asking the station-master to chalk up on the black bulletin-board—used for announcing the time of arrival and departure of trains—the news of the great battle, with its accompanying slaughter. This he was to do at once; while I agreed, in return, to supply him 'free, gratis, for nothing,' a *Harper's Weekly*, a *Harper's Monthly*, and a daily evening paper during the next six months from that date.

"This bargain struck, I began to bethink me how I was to get enough papers to make the grand coup I intended. I had very little cash, and I feared, still less credit. I went to the superintendent of the delivery department and proffered a modest request for one thousand copies of the *Free Press* on trust. But I was not much surprised when my request was curtly and gruffly refused. In those days, though, I was a pretty cheeky boy, and I felt desperate, for I saw a small fortune in prospect if my telegraph operator had kept his word—a point on which I was still a trifle doubtful. Nerving myself for a great stroke, I marched upstairs into the office of Wilbur F. Storey himself, and asked to see him. A few minutes later I was shown in to him. I told him who I was, and that I wanted fifteen hundred copies of the paper on credit. The tall, thin, dark-eyed, ascetic-looking man stared at me for a moment, and then scratched a few words on a slip of paper. 'Take that down stairs,' said he, 'and you will get what you want.' And so I did. Then I felt happier than I have ever felt since.

"I took my fifteen hundred papers, got three boys to help me fold them, and mounted the train, all agog to find out whether the telegraph operator had kept his word. At the town where our first stop was made I usually sold two papers. As the train swung into the station I looked ahead, and thought there must be a riot

going on. A big crowd filled the platform, and as the train drew up I began to realize that they wanted my papers. Before we left I had sold a hundred or two at five cents apiece. At the next station the place was fairly black with people. I raised the ante, and sold three hundred papers at ten cents each. So it went on until Port Huron was reached. Then I transferred my remaining stock to the wagon which always waited for me there, hired a small box to sit on the pile of papers in the back of the wagon, so as to discount any pilfering, and sold out every paper I had at a quarter of a dollar or more per copy. I remembered I passed a church full of worshippers and stopped to yell out my news. In ten seconds there was not a soul left in meeting. All of them, including the parson, were clustered around me, bidding against each other for copies of the precious paper.

"You can understand why it struck me then that the telegraph must be about the best thing going, for it was the telegraphic notices on the bulletin boards that had done the trick. I determined at once to become a telegraph operator. But if it hadn't been for Wilbur F. Storey I should never have fully appreciated the wonders of electrical science."

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"In simple language, the author lays bare the secrets of electrical science, and application. . . . The arrangement is systematical, the cuts are good, the typography and binding in cloth are excellent, and altogether the work is one we can heartily commend."—*Electrical World*.

"The need of such a book has undoubtedly been felt by many, young and old. . . . This work supplies the foundation for a more thorough knowledge of this interesting subject. Its illustrations and comparisons are drawn from objects and simple facts familiar to all, and its language is perfectly plain. Taken altogether, the book is deserving of success, and we predict for it a splendid sale."—*The Age of Steel*.

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"An instructive little book, whose purpose is simply described by its title, and is endorsed by no less an authority than Mr. Edison. It explains simply and concisely the uses to which electricity is put by modern science, and describes the various methods by which it is produced and rendered available. The author has succeeded admirably in adapting his work to the object for which it was intended."—*Gazette, Boston*.

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Parties desiring to purchase any of the following electrical patents, please address H. D. Rogers, Patentee and Agent, 75 Maiden Lane, New York.

1. *Patent No. 290,121.* Electrical Conductor. A conductor for carrying the heavy currents in electric lighting, and the distribution of power by electricity, and for other purposes.

2. *Patent No. 290,122.* Electrical Conductor or Cable for Lighting and other Systems. A conductor or cable for supplying electric lamps, motors and similar apparatus, designed to obviate or lessen the danger to life and property, liable to occur with ordinary conductors.

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4. *Patent No. 292,694.* Insulated Conductor of Electricity. A fire-proof compound for bare or insulated wires.

5. *Patent No. 139,690.* Printing and Dial Telegraph and Circuits therefor. Function of two week printer with one wheel, a type wheel formed by the union of a lettered strip of metal or other material, etc. A unique and valuable device.

6. *Patent No. 305,022.* Self-sustaining Electric Battery. A battery of large and constant electro-motive force and to obviate polarization.

7. *Patent No. 310,724.* Secondary Battery and means for transporting the same. The object of this invention is to accumulate electric energy in suitable storage chambers at natural sources, and convey the same to desirable points by land or water, in apartments adapted to the vehicles conveying the same; also for a device for running trains, etc., by dispensing with the third rail.

Also other patents for sale.

ELECTRICAL PATENTS ISSUED FEBRUARY 4TH.

420,444. Thermal Cut-Out. George Farrell, New York, N. Y.
 420,469. Regulation of Electric Motors. Lemuel W. Serrell, Plainfield, N. J., and Harvey L. Lufkin, New York, N. Y.
 420,500. Electric Drill. Imle E. Storey, Boulder, Col.
 420,543. Electric Street-Car Gear. Edgar Peckham, New York, N. Y.
 420,544. Electric-Car Gear. Edgar Peckham, New York, N. Y.
 420,545. Electric-Car Axle. Edgar Peckham, New York, N. Y.
 420,552. Extension-Electrolier. James E. Brown and John F. Brown, Brooklyn, N. Y., assignors to the Archer & Pancoast Manufacturing Company, of New York.
 420,594. Quadruplex Telegraph. Thomas A. Edison, Menlo Park, N. J., assignor to the Western Union Telegraph Company, New York, N. Y.
 420,611. Electric Brush. John E. Stephens, Cincinnati, Ohio.
 420,622. Electrical Lock-Switch. Edward N. Dickerson, Jr., New York, N. Y.
 420,638. Cable-Hanger. William A. Conner, Pittsburg, Pa.
 420,641. Method of Electric Refrigeration. Mark W. Dewey, Syracuse, N. Y., assignor to the Dewey Corporation, same place.

420,648. Insulating Compound. James B. Williams, San Francisco, Cal.
 420,693. Electro-Magnetic Car-Brake. Daniel S. McElroy, New York, N. Y.
 420,697. Burglar-Alarm. Noah M. Powell, Reger, Mo.
 420,705. Electric-Lamp Adapter. James Stewart, New York, N. Y., assignor of one-half to Edmund C. Stanton, same place.
 420,706. Electric-Lamp Adapter. James Stewart, New York, N. Y., assignor of one-half to Edmund C. Stanton, same place.
 420,710. Bipolar Prostatic Electrolyzer. Richard M. Bache, Philadelphia, Pa.
 420,740. Electric Belt. Albert J. Sheffield, Griggsville, Ill.
 420,762. Electric Meter. James D. Bishop, Chicago, Ill.
 420,764. Thermo-Electric Generator. Charles S. Bradley, Yonkers, N. Y.
 420,804. Conduit for Electric Railways. Delbert E. Johnson, Atlanta, Ga.
 420,816. Electrically-Reciprocated Tool. Harry N. Marvin, Syracuse, N. Y.
 420,833. Autographic Telegraph. James H. Robertson, Brooklyn, assignor to the Writing Telegraph Company, New York, N. Y.
 420,834. Electric Door-Opener. George A. Seib, New York, N. Y., assignor of one-half to Otto Starke, same place.
 420,840. Electro-Magnetic Abdominal Support. Mary E. Thomas, Cardington, Ohio.
 420,850. Electrical Recording-Instrument.

Frank B. Wood, New York, N. Y., assignor to the E. S. Greeley & Company, of Connecticut.
 420,851. Method of Electrically Recording Signals. Frank B. Wood, New York, N. Y., assignor to the E. S. Greeley & Company, of Connecticut.
 420,852. Apparatus for Electrically Recording Signals. Frank B. Wood, New York, N. Y., assignor to the E. S. Greeley & Company, of Connecticut.
 420,858. Electric Railway-Signal. George W. Boss, Minneapolis, Minn.
 420,859. Electric Railway-Signal. George W. Boss, Minneapolis, Minn.
 420,881. Filament for Incandescent Lights. Rudolf Langhans, Berlin, Germany. Patented in Germany, France, England, Belgium and Italy.
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Catalogue and Price-List

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PRIZE STORIES.

A HEROINE OF THE KEY.

(No. 8.)

Josephine Deane, standing at her office window, looking at the mountains that rise around her, makes a pretty picture as the sun shines in upon her golden hair. It was about three months after the great strike of 1882, and our heroine had been among the first to leave her key, but when it ended she found like many others that her services were no longer required, and she had been compelled to leave home and accept her present position as railroad operator in the small town of Jessica. She was not thinking of this now, though, but of merry-hearted Charlie Carrington.

How strange his conduct had been. It was now four months since she had seen him. While they had not been engaged, Josephine had been sure he loved her. He left the city suddenly, though a short time before she did, and she had never heard from him. But to resume our story. As Jo stands looking sadly out, her instrument begins ticking, and she hastens to answer as she recognizes the superintendent's call. Her cheek pales as she hears the following: "Stop fast mail due Jessica four-thirty before it crosses Deep Ravine bridge. Wreckers at work."

She understood it. The laborers of the road had struck a short time ago; the road was a lonely one, and already several wrecks had occurred. Could she save the train? It was now four o'clock and the bridge was a mile away. Picking up a shawl that was lying near, Jo ran out of the office and along the road toward the mountain. She can see the bridge in the distance. What is that she hears? It is the train! She makes one last effort, crosses the bridge, and runs wildly down the track. The engineer sees her, the train begins to slacken, then all grows dark around her, and she sinks to the ground unconscious. The train is stopped a few feet from the bridge and the passengers with wondering faces crowd around her. Suddenly one among them gives an inarticulate cry, and throws himself beside her, calling her name. As Jo slowly regains consciousness, hears her name called, and recognizes the voice, she thinks she is in heaven, until a motherly voice says, "don't take on so, honey; she's only fainted." Jo opens her eyes and sees Charlie Carrington bending over her. When they have become a little calmer, Jo tells them of the message she received, and upon investigation they find the rails have been misplaced. Then Charlie explains how he had found in the lining of an old coat that morning the letter he thought he had mailed her on leaving the city months before, asking her to become his wife. The passengers comprehending the situation, offer congratulations, and so the belated train proceeds on its way. Jo and Charlie stand with clasped hands as cheer after cheer rings out for the brave little telegraph operator. HONEY.

ST. LOUIS WESTERN UNION NOTES.—Arrivals: Van B. Dye, New Orleans; F. L. Carter, Chicago; John Tuehey, Chicago; A. E. Malone, Detroit; W. O. Tremaine from United Press; Gerald Smythe from Broker; Mat. Herrington from Old Mexico, and J. B. Sheldon from railroad. Departures: Jno. Tracy, to Chicago; A. S. Brown and J. T. Wilson. E. J. Hanlon, who has returned after a long illness, has been transferred from the night force to day-extra. The company having established an electric time system in this city, will soon dispense observatory time to its patrons fresh from the wires. Mr. James Maddox has been placed in

agent and operator at the Union Depot for the past four years, and has abundant wishes for success from all who know him. At the Postal office we find Mr. C. O. Fuller, manager, and Mr. Sharpless B. Runyan as operator, both of whom are doing good work for the company. Miss Miller, of Omaha, is manager at the Pearl street office in the wholesale district, and is much liked by all who know her. The Postal has lately set up a quad, and is now able and ready to do business with Chicago and Eastern points promptly, having exclusive use of one side to Chicago and the other to Kansas City, thus giving them a duplex to each place. They also talk strongly of building a wire to Sioux Falls, South Dakota, which will help them out immensely in a business way, so that with the untiring energy of their manager, Mr. Fuller, the company will meet with great success in this city.

JACKSONVILLE, FLA., NOTES.—The more recent additions to our force are Messrs. F. B. Priest, A. L. Wisner, D. L. Culver, McLearn, Fred. Gibson, E. T. Simmons, W. A. King, M. P. Dundon, F. H. Wigg, J. M. Senn and Miss Mason. Mr. C. A. Wood has left us to go with the J. T. & K. W. Owing to the mild winter all over the States, the "Florida season" is not as lively as we should like to see it, although we are doing a fairly good business, and young alligators bring about the same prices as heretofore. George Harris has a phosphate mine, and "phosphate is king" hereabouts just now. Mr. Culver takes the Cuba cables on the typewriter, and, while it makes him hustle to change the sheets, he gets there so cleverly that the operator on the other side is "stuck on his copy." It read, "Ship car dressed cats;" it should have read, "Ship car best oats." A clever master of transportation hands in the following as a specimen of nerve: "Can't you send me some empty cattle cars to fertilize my garden." McGinty and la Grippe still linger with us.

ERIE RY. NOTES.—Tom Gannon and M. S. Hanrahan were transferred from the old depot at Port Jervis, to the coal switch. Al. Duley, who has had a hard tussle with the grip, is rather pleased to have lost his "grip." Charles Frank is again working at "Jc." office after a rest. A change in the dispatchers' office at Jersey City has changed M. J. Maloney to third trick. T. H. Pendle on first trick, with W. F. Casey; Paul A. Lord on second trick, with D. Hallidy. Garry Remsen, who worked at Grey Court for a long time, gave up the telegraph business for the more profitable one of a grocery store, finds after two years' experience that telegraphing is good enough for him. J. A. Ashhurst, who was inspector of signals, has left the Erie, and John Cleary is now filling the place temporarily. One of the operators will probably get the position. Fred. Foster, an old-time operator, was recently appointed supervisor of signals for the Erie system. Mr. Wright from Middletown has entered upon a new field of labor in New York; J. C. Gillen succeeds him at Middletown. Martin Gillen, who worked at Paterson, is now with the W. U. at same place. Geo. Doell has been at Ridge-wood Junction, Mat. Thompson at Erie Junction, Garry Remsen at East Paterson and W. Walsh at "Ms."

ST. LOUIS WESTERN UNION NOTES.—Arrivals: Van B. Dye, New Orleans; F. L. Carter, Chicago; John Tuehey, Chicago; A. E. Malone, Detroit; W. O. Tremaine from United Press; Gerald Smythe from Broker; Mat. Herrington from Old Mexico, and J. B. Sheldon from railroad. Departures: Jno. Tracy, to Chicago; A. S. Brown and J. T. Wilson. E. J. Hanlon, who has returned after a long illness, has been transferred from the night force to day-extra. The company having established an electric time system in this city, will soon dispense observatory time to its patrons fresh from the wires. Mr. James Maddox has been placed in

charge of this department. Hereafter, Jim will transact all business "on tick." The office is now thoroughly equipped with fire escapes, so well, indeed, that personal injury in case of fire seems almost impossible. J. B. Sanders, formerly with the Missouri Pacific here, who returned from Mexico to his home in this city, died on the twenty-second of last month. He was at one time well known in telegraphic circles. Mr. C. E. Cummings, of the Wheatstone department, mourns the loss of his mother, who died on February 1st, after a short illness. Mr. Cummings has the sympathy of the entire force. The photographs presented to the office by the AGE, suitably framed for hanging, have been the centre of attraction lately. The ladies of the office, whose fair countenances appear so favorably in the several groups, would, we believe, furnish the subjects for a composite photograph such as could not be equalled by any office in the country.

A FRAUD.—A railroad operator in a Minnesota town is sending out letters to operators at distant points, in which he advertises a raffle for a span of horses which he claims are worth \$500, and encloses three tickets to be sold at \$1 each. He claims to be badly crippled, and has a large family to support. The postmaster at the point says the man is a dead beat and a fraud.

STRAY TELEGRAMS.—Telegrams frequently stray from their path in transmission. The most remarkable instance of this sort occurred recently. A cablegram originating at Athens, Greece, and addressed to the Baron de —, Mentone, was sent to Chicago from New York, by the Central Cable Company for transmission to Mentone, Indiana. That office immediately reported non-delivery on account of addressee being unknown there, and suggested that the Cable Company try Mentone, France, and that point finally proved to be the correct destination of the cablegram. Just how the message got so far away from its proper route is hard to explain.

THEY LIKE TO HELLO.—An official of a telephone company says there is no work that has such a fascination for women as operating in the central office of a telephone company. Very few of them ever leave because they are dissatisfied with the work. They go in, go through all the grades and the several increases of salary which fall to them under the length-of-service rules of the company, get married, and resign. That is about the history of a telephone girl. The pay is good and some of them get \$60 a month, but the work is very exacting. It requires constant attention, and the strain on the nerves is very great while it lasts.

NOT FOND OF MUSIC.—Chief Walker of the Philadelphia Electrical Department received this note a few days ago: "Dear Sir: When you commence burying the wires I wish you would give your attention to those of the piano in the house next door to me."

POPPING THE QUESTION BY TELEPHONE.—There is a story going the rounds of a young man's popping the question by telephone. He knew his rival was at the house of his inamorata for the purpose of leaving his heart with her. He called the young lady to the 'phone, secured the desired answer, and sent a ring by a messenger boy.

PHOTOGRAPHS BY WIRE.—It is said that Edison is now perfecting a device by which photographs can be taken by wire. Instead of transmitting sound the wire transmits light.

The phonograph has the rare art of taking in all that is said and yet not getting talked to death. Many, many editors are wishing they had been born with a phonographic attachment.

GOVERNMENT TELEGRAPHY.

MR. WANAMAKER'S PROPOSED ADDITION TO THE POSTAL SERVICE.

Postmaster-General Wanamaker argued before the House Committee on Post-Offices and Post Roads in Washington, on the 11th inst., favoring the establishment of a limited postal telegraph. Dr. Norvin Green, the President of the W. U. Telegraph Company, and Mr. Chandler, the President of the Postal Telegraph Company, had been invited to attend the meeting, but neither of them was present. Mr. Wanamaker said he asked the support of the committee in favor of a short bill investing the Postmaster-General with authority to enter into a contract with responsible persons to connect a certain number of post-offices with each other by telegraph, by leasing wires and instruments to be operated by post-office employes. He was not proposing, he said, that the Government should purchase or build a telegraph line, nor the appropriation of a large sum from the Treasury, nor the creating of a new body of employes, but simply the utilization of the office buildings, clerks and carriers now in use, and by convenience and economy of service greatly to accommodate the public in a business that should not be divorced from the post-office, as it was nothing more or less than the carrying of messages. He said he proposed a union of post and telegraph on a basis that, in his judgment, would not interfere to any appreciable extent with any existing rights, but that would offer incalculable service to classes not now enjoying the use of the telegraph to any large degree. He asked that he be directed to negotiate for and secure a set of leased wires, such as the great newspapers have from city to city, or brokers and bankers have connecting their offices in the different cities, so that "the common people" might communicate through their business offices (the post-offices) from city to city, or by messages dropped in their mail boxes.

The people had now, Mr. Wanamaker continued, the business offices, the clerks, who could soon learn the tick of the machines, the carriers who travelled with bundles of letters over the same streets traversed by telegraph boys, and the stamps for payment that dispense with bookkeeping, and all that was needed to build up the new service was authority and a wire, and a new thrill of life would soon be felt throughout the country. Such a service was the legitimate work of the post-office, and the people were right in stoutly demanding telegraph facilities at postal stations.

Mr. Wanamaker said that \$100,000,000 of net profits had been paid over by the people to the Western Union Telegraph Company in twenty-three years. The revenues of the Post-Office Department had doubled within fifteen years; the business and receipts of the Western Union Telegraph Company had doubled in ten years. Experience had shown that in the post-office, as well as in the telegraph service, every added facility, convenience and cheapness, had found an immediate response from the public. It was said that 85 to 90 per cent. of the telegraph business of the United States was commercial and speculative, less than five per cent. family and social, while in Great Britain the family and social business was over fifty per cent. of the whole. It was also said that not more than two per cent. of the people of the United States used the telegraph. Sixty million people should not be taxed to pay a deficit sure to be caused by cheap telegraph rates benefiting one and one-fourth millions only—rich and commercial speculators. This proposed system would enable the Post-Office Department to increase its business very largely and make more money, and there would be no deficit. Mr. Wanamaker said:

"The Post-Office Department is not now self-sustaining, because it is charged with carry-

ing free the five to six million dollars' worth of mail matter of the various executive departments of the Government, handling the newspapers of the country for practically nothing, and allowing the opportunity to pass of transmitting cheap telegraph messages because there are incorporated companies who dispute the ground and maintain an exclusively and highly paid service."

He did not want to be understood as saying that his proposed plan would lessen the business of the Western Union. A new business would be created.

Mr. Wanamaker had prepared a bill which embodied his views on the subject. Its provisions are:

"SECTION 1. Be it enacted, etc., that for the purpose of facilitating the transmission of correspondence among the people, and of promoting commerce between the several States, the limited post and telegraph service is hereby established as a bureau or part of the Post-Office Department of the United States, and postal telegrams shall be received at post-offices, transmitted by telegraph, and delivered through the medium of the post office service in the manner herein described. All post-offices in places where the free delivery service now exists, or may hereafter be established during the operation of this act, shall be postal telegraph stations, and the Postmaster-General shall, from time to time designate as postal stations post-offices in other places where, in his judgment, the wants of the public may be supplied under the operations of this act.

"SEC. 2. That the Postmaster-General, with the concurrence of the Secretary of the Treasury and the Attorney-General, shall contract for a period not exceeding ten years with one or more telegraph companies, under such conditions as shall in his judgment best fulfill the purposes of this act, but subject to all the provisions named in this act, for the transmission by telegraph or postal telegrams as herein provided, or for the furnishing of the lines. Postal telegrams may be written or printed upon postal telegram forms or cards to be supplied by the Post-Office Department or upon any other suggested forms to be supplied by the sender, provided that in the latter event stamps of sufficient value shall be affixed to the communication to cover the cost of the service, as herein provided. Postal telegrams may be forwarded by mail from any post office in the United States to any postal telegram office, and shall there be transmitted by telegraph, provided the necessary telegram postage, as herein provided, shall be paid. Postal telegrams bearing special delivery stamps shall have special delivery. No liability shall accrue against the Post Office Department or telegraph company on account of errors or delays in the transmission of telegrams. Nothing in this act shall be so construed as to prohibit any telegraph company from performing a general business for the public as the same is now done.

"SEC. 3. That postal telegrams shall be transmitted in the order of filing, except that priority shall be given to service telegrams and telegrams on the business of the Government of the United States, or of any of its departments, whenever so required by the sender. Postal telegrams may be prepaid either in whole or in part by means of ordinary postage stamps, provided the words 'Postal Telegram' shall be plainly written, printed or stamped across the face of the form containing the telegrams. Postal telegrams which are not fully prepaid, but to which are affixed stamps in an amount sufficient to pay letter postage, shall be forwarded by mail to the addressee.

"SEC. 4. That the money order service of the Post-Office Department shall, as soon as practicable, be adopted, under such rules and regulations as the Postmaster-General may prescribe, between such post-offices as may from time to time be designated by him as postal

telegram money order officers; and he shall fix the fees to be charged for postal telegraph money orders, which fees shall not exceed double the rates now charged for domestic money orders in addition to double the charge for postal telegrams of twenty words; but no postal telegraph money order shall exceed in amount \$100.

"SEC. 5. That the Postmaster-General shall provide suitable space or room in the post-office buildings as postal telegraph stations for the wires, instruments, apparatus and operation of the telegraph, so far as he may deem necessary for the purposes of this act. The Post-Office Department shall be entitled to a sum equal to — cents for each postal telegram originating at such post-office.

"SEC. 6. That the Postmaster-General is hereby clothed with full authority to prescribe regulations, not inconsistent with the law, for carrying out the purposes of this act and for the conduct of the service for which it provides.

"SEC. 7. The charges in any one State shall not exceed ten cents for messages of twenty words or less, counting address and signature, nor over twenty five cents for any distance under fifteen hundred miles, nor over fifty cents for any greater distance, said rates and rules and regulations to be prescribed by the Postmaster-General.

"SEC. 8. That the sum of \$ — is hereby appropriated out of any moneys in the Treasury unappropriated, to be immediately available upon the requisition of the Postmaster-General for the purpose of establishing the limited post and telegraph service, and for its maintenance and operation during the fiscal year ending June 30, 1891, and including the preliminary expenses in connection therewith."

When Mr. Wanamaker finished his argument and read the provisions in his bill he was asked a number of questions by the members of the committee. He said he did not deem it practicable at the present time to establish a rate for messages uniform over the whole country. It might be done, however, at some future time, and he was very much impressed with such an idea. He suggested in regard to employees at these postal stations that they could act as operators as well as clerks. Telegraphy, he said, was taught in colleges and other places considerably at present. These employees could be supplied by the Civil Service Commission. He said he limited the duration of the proposed lease to ten years, among other reasons, because it was difficult to get capitalists who might desire to aid in developing the system to invest their money for a shorter time. He thought it would be a good thing for the committees of Congress to fix the rates for messages in the proposed system. There could not then be brought against the Postmaster-General any complaint that his action in fixing these rates had been arbitrary.

MONKEYS ON THE WIRES.—The telegraph wires in Southern Mexico are put to a use for which they were not originally intended—to furnish a gymnasium for our anthropological ancestors, the monkeys. They climb the telegraph poles, and, so the linemen say, in squads a hundred strong these athletes of the forest go through with their gymnastic exercise on the wires. The wires are often thus torn down.

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THE O. R. T. CONCLAVE.—Mr. W. P. Morgan, Ontonagon, Mich., a prominent member of the O. R. T., in a letter, says: "New York ought to be satisfied with the O. R. T. Conclave this year and not clamor for the World's Fair too. Congress and Governor Hill take notice."

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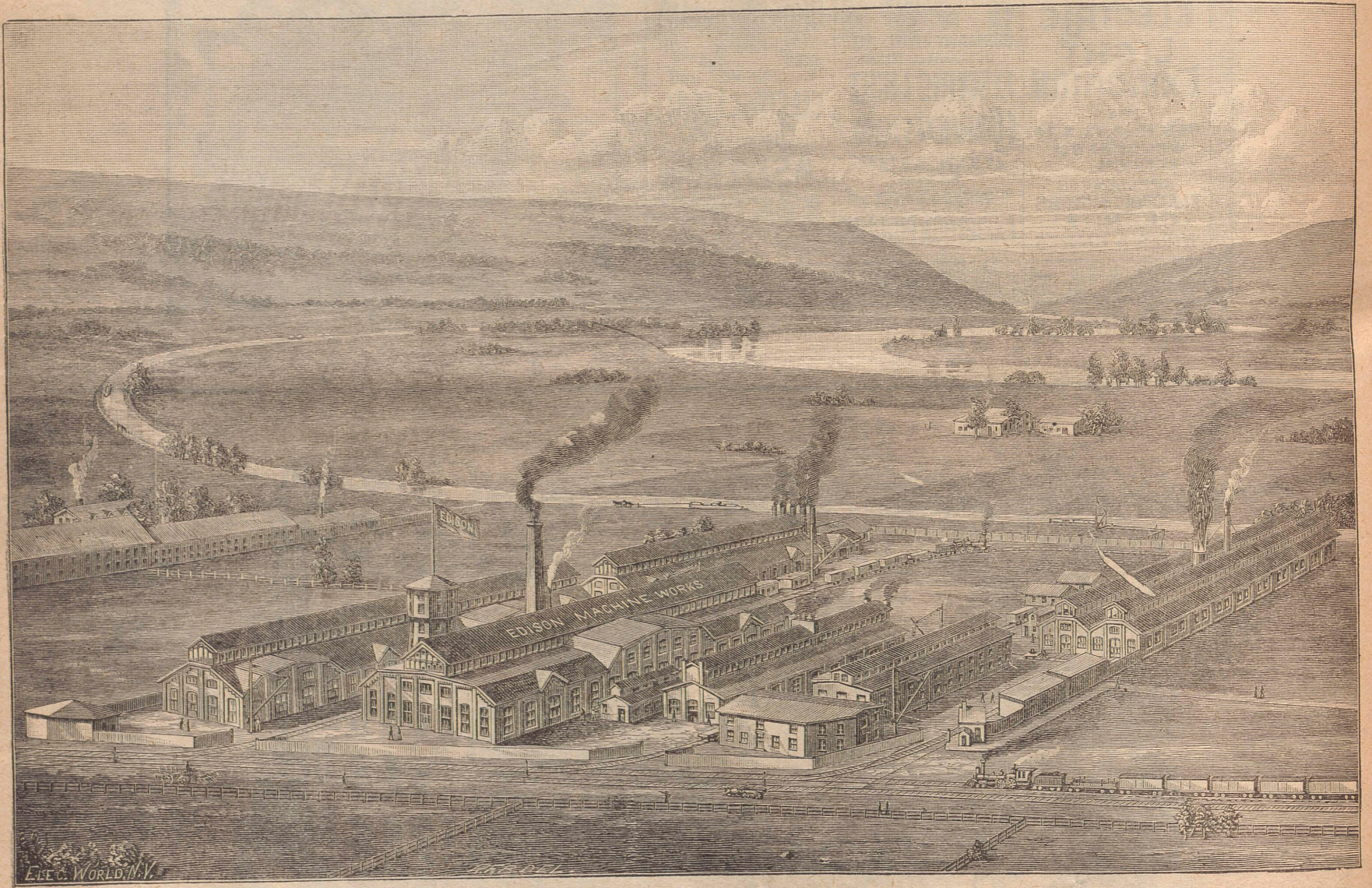
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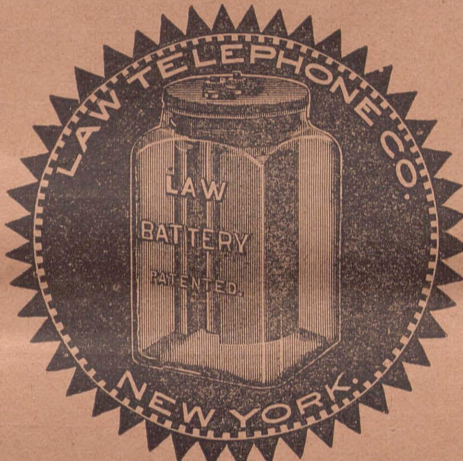
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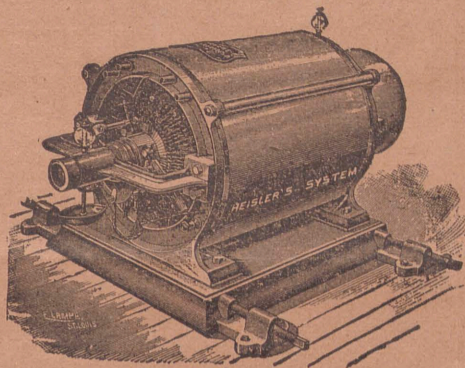
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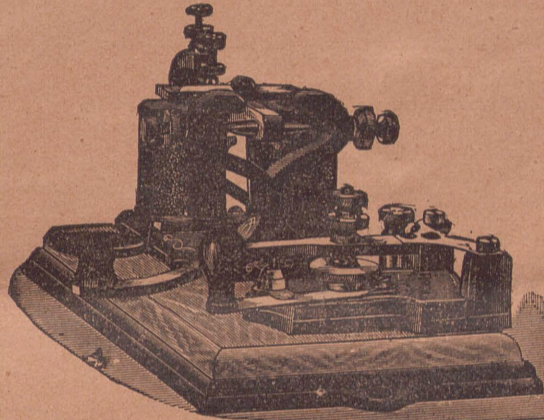


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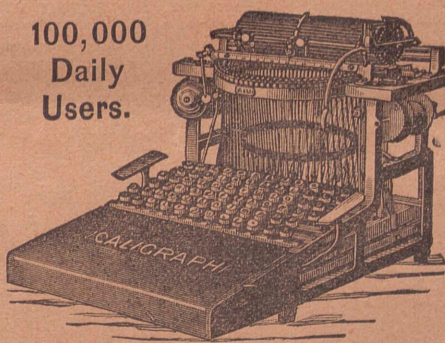
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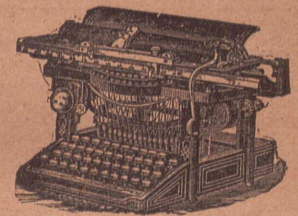


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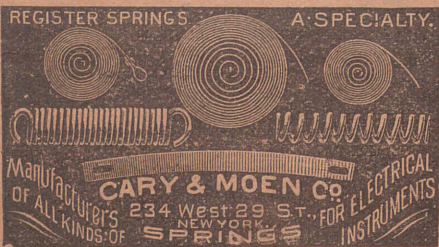
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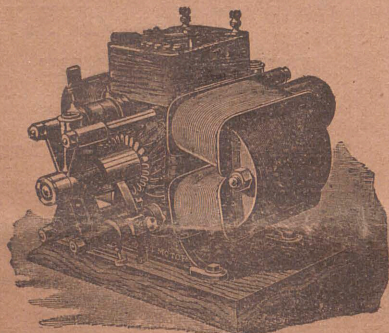
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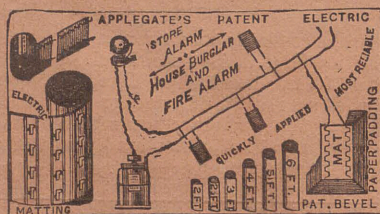
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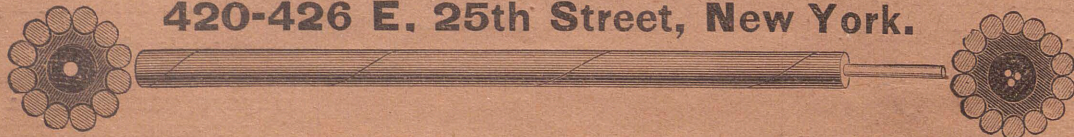
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